THE JOURNAL OF GAS LIGHTING
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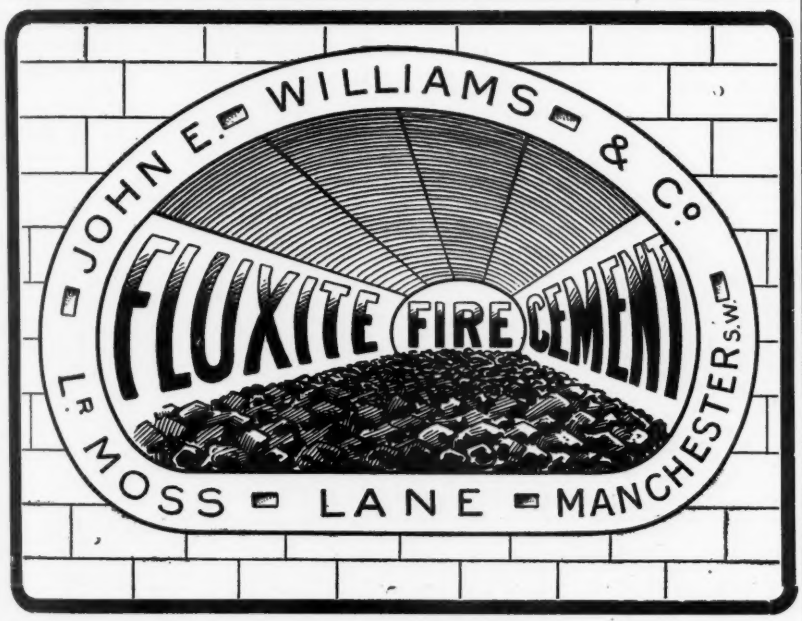

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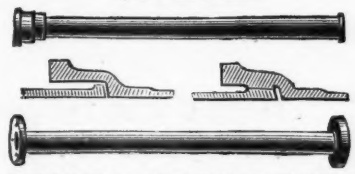

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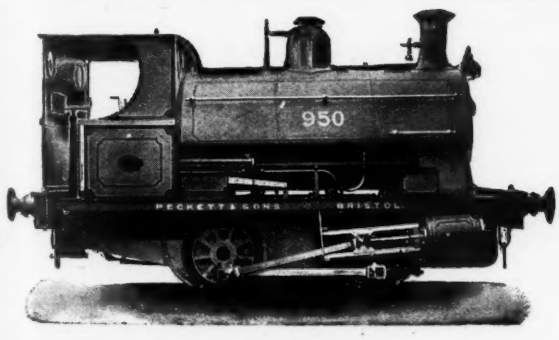

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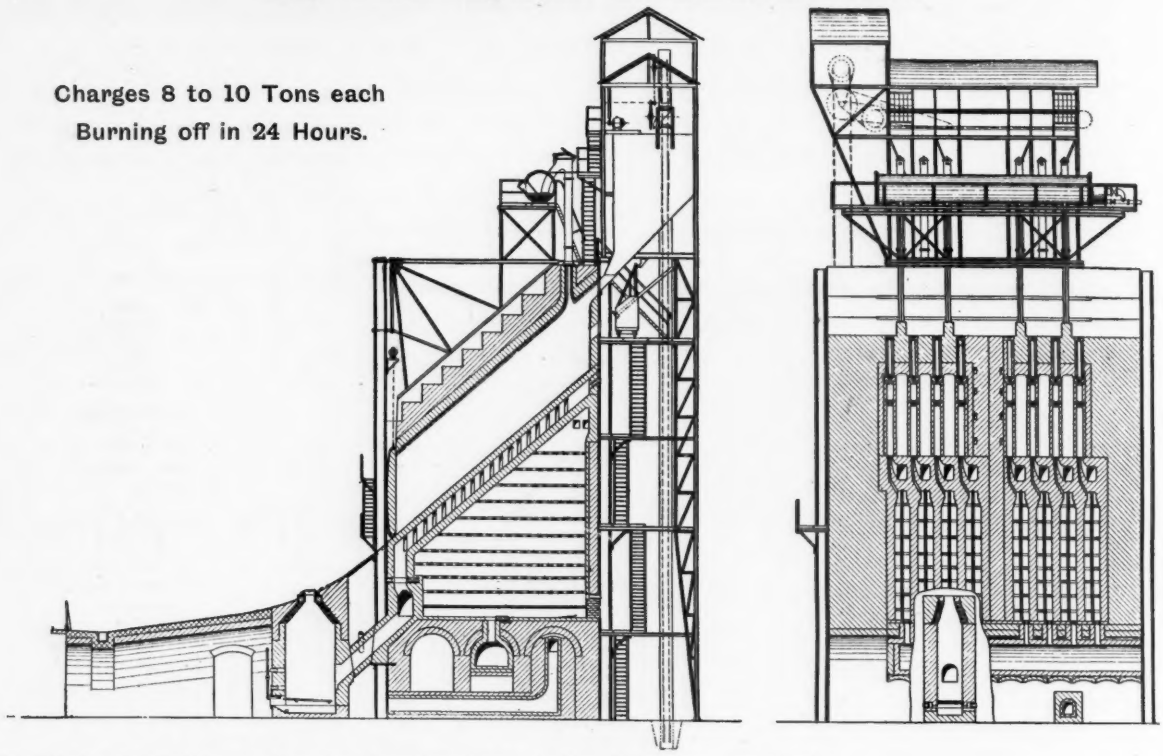

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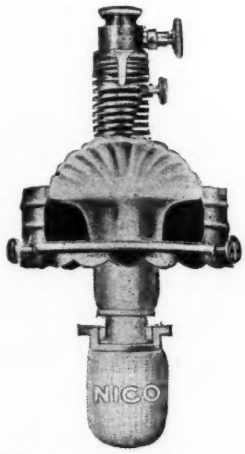

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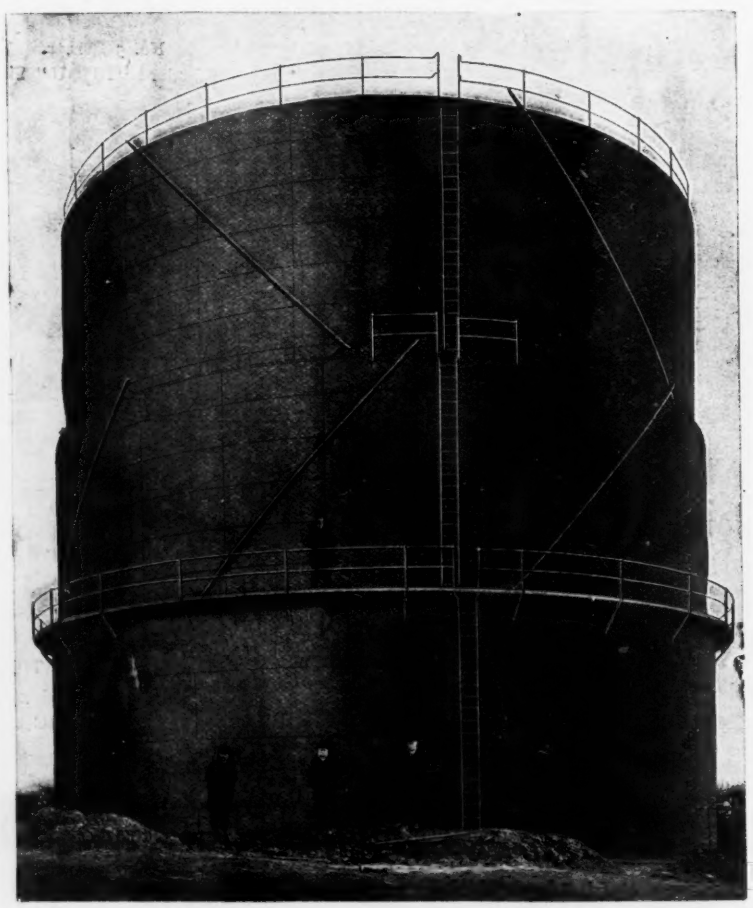

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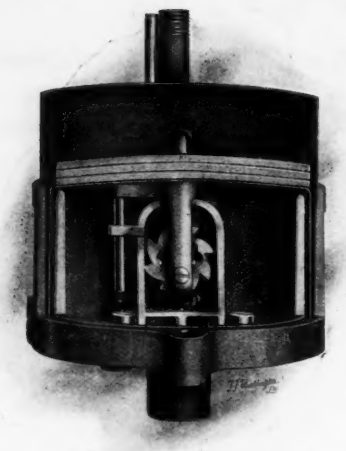

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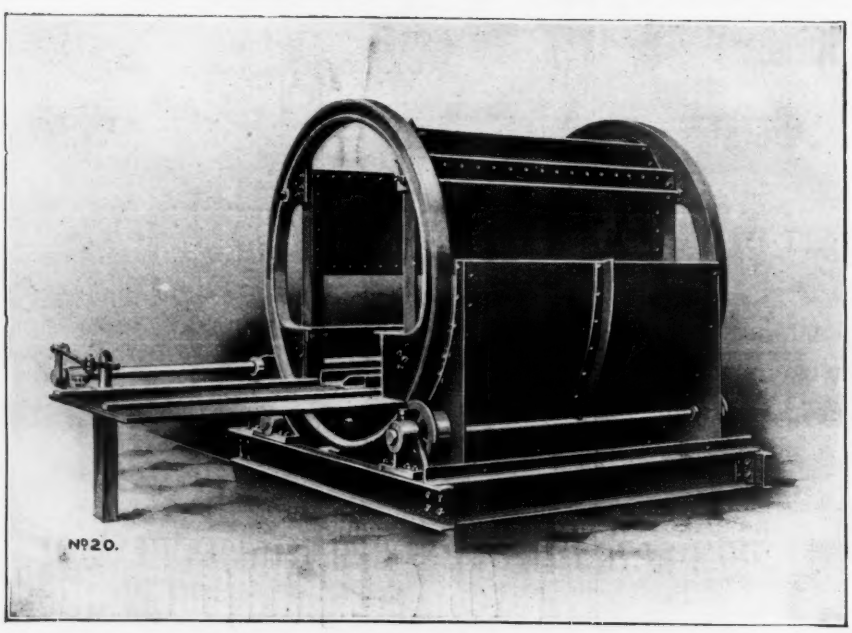

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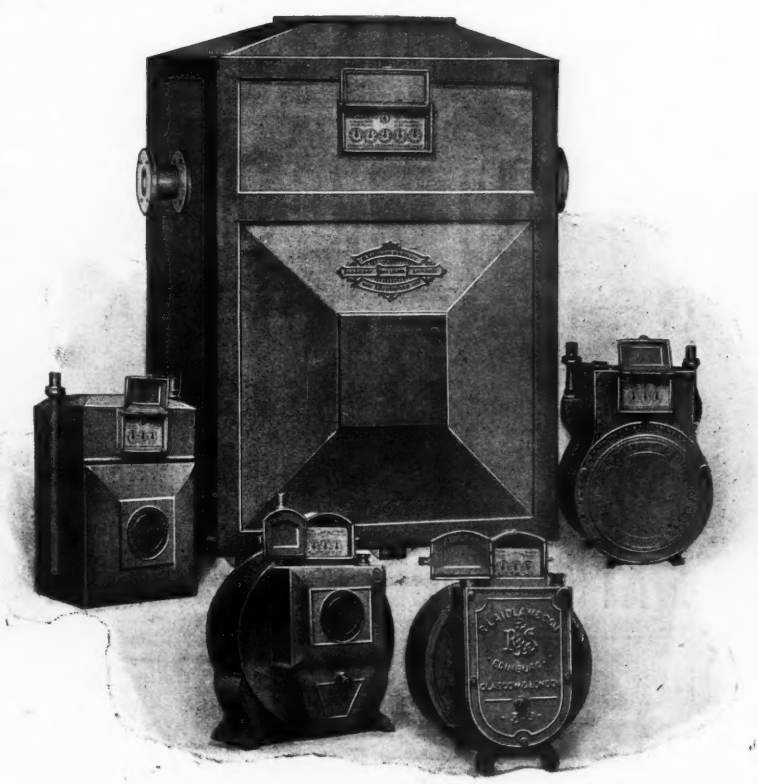

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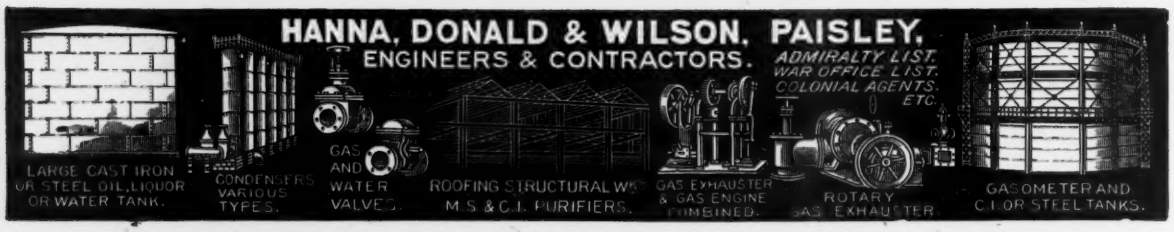
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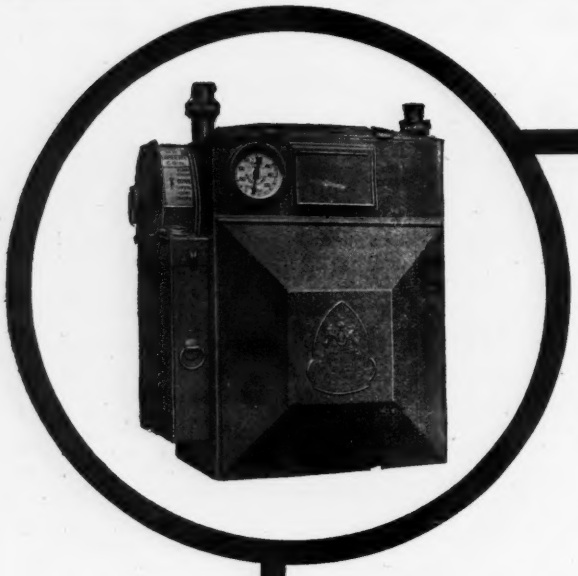

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VOL. CXI., No. 2471.—TUESDAY, SEPTEMBER 20, 1910.

EDITORIAL NOTES—GAS, &c.

The Relations of Municipal Gas and Electricity Departments.

SERIOUS efforts are being made by the executive officers of the Manchester Corporation Gas and Electricity Departments to compose their differences, and to establish a policy of goodwill and peace between the two undertakings. This is no doubt very right and proper; but it must be confessed that we are not very sanguine of permanent success. An indication of the contents of a report by the chief executive officials of the two concerns appeared in the "JOURNAL" last week; and it shows that they at all events are, as the result of conference, in a very conciliatory mood just at the present time. But the fact that conference was deemed necessary under the conditions that have grown up since the Electricity Department came into being, and that the report in question has been prepared, are really a reflection on the municipal direction of trading enterprises, and on certain of the issues of that direction. It is against the economic interests of such undertakings as gas and electricity supply and of the consumers (*quâ* consumers) that there should be anything but the keenest competition; but such competition can only be obtained on level ground where the management is by competing private enterprise, and where conditions of favouritism and undue financial burdens are not laid upon the consumers, as sometimes happens in the case of the municipal control of gas and electricity undertakings. It is beyond the power of any code of regulations, or of resolutions, or understandings with two undertakings each striving to get all the business it can, to prevent transgression at many points, and whenever opportunity offers. Moreover, such a code of regulations, or such resolutions, or understandings will not lessen misgiving and watchfulness on the part of the two departments; the very existence of regulations, resolutions, or understandings must inure to the sharpening of the look-out to discover signs of, or actual, transgression. It cannot therefore be seen that, after the novelty of understanding has worn off, there will be any softening of animosities engendered by what are to all intents and purposes antagonistic interests.

In this report from Manchester as to the findings of the chief executive officials of the two departments, one conclusion is that, in respect of the prices charged for gas and electricity by the undertakings, the officials have, on the one side and on the other, been convinced that all the prices are fixed on recognized principles, and that no useful purpose can be served by the one department criticizing the other. But we fancy that Mr. S. L. Pearce, the Chief Engineer of the Electricity Department, has had more difficulty in persuading Mr. J. G. Newbigging of the soundness of charges ranging from 3¾ per unit for lighting and a bottom price of 0·7d. per unit for power, than Mr. Newbigging has had in convincing Mr. Pearce that there is justification in the differences in the ordinary charges for gas in the city of 2s. 3d. per 1000 cubic feet for lighting and of 1s. 9d. for power purposes. We should like to see what would be said if the bottom price for gas for power in Manchester was (say) 5·4d. per 1000 cubic feet.

Another point on which the executive officials have arrived at an understanding is a most important one; but whether it will ever get any farther than being a mere expression of opinion, until there is enforcement by the Legislature, it is impossible to say. It is patent, however, that the large municipal corporations who have with merciless hand been dipping into the profits of their gas undertakings in aid of the rates, are now becoming genuinely alarmed over what has been happening in Parliament; for they have visions of the days when they themselves will be before Parliament giving an account of their stewardship, and having to confess to the gross abuse of the appropriation privilege allowed in days long since. But the habit has grown so strong, that we are doubtful as to any voluntary relinquishment preceding the compulsory one in conformity with the latest practice of the Legislature. Take Manchester, the Council have appropriated from the gas profits more in aid of the rates than the sum of the loans raised for gas-supply purposes; and the normal amount they have annually taken for many years now has been £50,000. On the other hand, the Electricity Department has only lately found it possible to scrape together a few thousands to silence the clamorous voice for profits. Strong and dignified has been the protest by Alderman Gibson, the Chairman of the Gas Committee, against the robbery of the gas consumers; and no less so has been the antagonism of Mr. Newbigging to the system. Still the Council declined to favourably hearken to the voice of justice. Now the Electricity Committee are disinclined to quietly submit to their customers being plundered when they could well do—the same with the competing department in relation to gas—with the profits to assist them in rendering the best electrical service to the city. The Gas Department, however, is the one with the greatest cause of complaint; while the Electricity Department look upon the question perspectively with the history of the Gas Department throwing a heavy shadow over their reflections.

However, the executive officials of the two departments have, in regard to this matter, got into the same boat; and they are unanimously agreed that the departments should be treated alike in respect of profit contribution to the rates. It must, it occurs to us, be a little *infra dig.* for the Electricity Department to find themselves such comparatively small contributors to the rates in comparison with the rival Gas Department. If, however, the difference can be lessened, so much the better for the reputation of the Electricity Department, and so much the more advantageous for the Gas Department. The agreement is to the effect that the officials who have been conferring concur with parliamentary practice as to the mortgage debt being taken as the basis upon which the rate-in-aid should be computed; and they believe the adoption of such a basis would remove all grounds of criticism in the future. But parliamentary practice in the case of Glasgow and Kirkcaldy in the present session of Parliament went a step further than this, by the blank refusal of profit appropriation in aid. But no one will deny that, if the practice of Parliament in this matter, in the case of English local authorities, is going to be on the lines of a percentage on outstanding mortgage debts, while the objectionable principle will not be removed, the limitation will be decidedly better than the existing much-abused licence. But what would the result be as affecting Manchester, and the relations of the two competing departments? The electricity undertaking would have, as the mortgage debts now stand, to contribute to the rates a larger sum annually than the gas undertaking. *Primâ facie*, this does not appear to be just. But that it is just, under the circumstances, is easily demonstrable by looking back at what the Gas Department has been called upon to do, and has done—though, truly, in no particularly willing or submissive spirit.

After all, the pious hopes in a righteous cause of the Manchester officials will not, we fear, until some higher power intervenes, pass from the abstract to the concrete state. After the tough fights that Alderman Gibson has had, though his hand is more strongly supported now than formerly, it will take some powerful force to loosen the grasp of the City Council upon the huge amount of gas profits that have annually been used in relief of the rates—in large part, of the rich electrical consumers. We sympathize freely with the officials in this matter, as also in the current feeling that better relations should be established between the Gas and Electricity Departments, by better understandings as to conduct, and by the stamping out of the financial differences that have been the source of irritation. But we cannot bring ourselves to believe that two undertakings whose businesses are essentially competitive can be conducted in anything but a competitive spirit, particularly when managed (as they should be managed, and are managed

at Manchester) by men jealous of the interests entrusted to them, and animated solely by a desire to serve those interests in the best possible manner. However, at the base of the policy of a municipal authority controlling two such competing undertakings should be placed the principle of "a "fair field, and no favour." The Electricity Department at Manchester has been a much-favoured, though somewhat at times unfortunate, child, while the gas undertaking has been a veritable beast of burden.

"Cause Unknown."

WITHIN a few yards of each other in the Brixton Road stand the blackened ruins of what were at one time two well-known and popularly patronized drapery emporiums. In one of the premises, there have been in recent times three fires, one of which was without doubt due to the fusion of an electric wire in one of the shop windows. The cause or causes of the other two fires cannot, in the absence of thorough investigation, be satisfactorily ascertained, and must be a matter of conjecture. In the case of the other building also, which was completely gutted on Aug. 20, no cause can be assigned. The last fire in the neighbourhood—that at Mr. Wallace Hughes' establishment—has resulted in the death of a lady assistant through a fatal leap taken in fright, and two other young women were seriously injured by also jumping from their bedroom windows. In these instances, there cannot be the same assurance concerning the initiation of the conflagrations as there was in the cases of the tragic Clapham and Accrington fires. They are cloaked in mystery; and it is high time—through the growing frequency of fires in such establishments, which fires are labelled "cause unknown"—that very searching technical inquiry was made into the origin of the outbreaks, which claim life, undermine health, and render girl assistants highly nervous, and keep them, or those who "live in," on tenter-hooks both day and night. Since the Clapham and the Accrington fires, the assistants in many such places have been losing all sense of security. At the opening of the inquest, last Thursday, on the young woman who lost her life through her fearful leap at Brixton, one of the assistants stated that she and her companions had become so nervous of fire that, when going to bed, they placed their clothes at the foot in readiness for any emergency. That is anything but a pleasant condition for the young women assistants in these drapery establishments to get into; and there is little wonder that, when the critical time does come, there is a tendency to lose their heads. However, there is the fact.

And what is this very mysterious something that is at the bottom of it all? At the inquest in question, the South London Electric Supply Corporation, Limited, were represented by Counsel. The opinion of the public as to the origin of the fires is strongly set; and the Electric Supply Corporation recognize this. There is no suggestion of foul play being associated with the Brixton fires. They have mostly broken out at night time after all lights have been turned off, and when the assistants are in bed. If the situation of the seat of the fire is known, that may offer suggestion; but otherwise further track is covered by the destruction occasioned by the fire. In connection with the first fire at Mr. Wallace Hughes' on Aug. 11, the manageress states that she saw a streak of light in one of the windows about 18 inches to 2 feet long, and directly afterwards the window was in flames. That window was electrically lighted. The second fire started in a basement; and a Fire Brigade officer declares that it was impossible for (say) a lighted match to be thrown through the outside grating anywhere near the place where the fire started. In regard to the third fire—the cause of which is recorded as "unknown"—the head porter at the premises states (according to the newspaper report before us) that, after the fire, he found the electric wires were in perfect order. Counsel for the Electric Supply Corporation was elated; but if the porter found them in order, a man with technical knowledge should find them so now. Are they in order? Judging from the condition of the premises to-day, we have misgivings on the point; but this statement does not preclude us from accepting more positive evidence if adduced at the adjourned inquest.

However, according to the "Evening News" last Wednesday, at least one fire insurance company has been stirred up by the "numerous fires at drapery establishments due to "electric light fittings." This Company are, in consequence, proposing to offer "to see to" the electrical installations of those who insure such premises through their office; and for the reason that "our experience, unfortunately, is that people "do not realize the dangers from faulty electric light fittings "and defective wiring." This all tends to show that the danger of electric lighting is not a matter that can be dismissed in the airy manner affected by our electrical contemporaries; and that, in the interests of both public safety and the electrical industry, the sooner there is a thorough expert investigation the better. The number of fires which are so frequently labelled now "cause unknown" is producing widespread uneasiness; and if anything can be done to learn more of their origin, it should be done, no matter the cost. The City Coroner has advised that there should be a public inquiry into every fire; and we are in full agreement with him. Who could be otherwise after recent happenings?

Labour in Congress.

FRESH from the factories and workshops of the country, delegates to the Trades Union Congress met in Sheffield last week, following, in doing so, rapidly in the wake of the meeting of the British Association for the Advancement of Science. In their respective realms, there is in one respect a similarity between their proceedings. A vast amount of good work is now being done by the British Association, as witness the reports that we have published; but there always is, and we fancy always will be, a part that is irrational practically. It is in this latter aspect that there is a correspondence—not proportionately, but in character—with the Trades Union Congress; for a large part of the proceedings is from the practical standpoint irrational, and only a small part gains, as being practical, the sympathy of those who have the well-being of the country's workers at heart, and who are intellectually superior to the influences of the doctrines and the nostrums of socialism—more particularly the modern brand. There was one striking feature about last week's proceedings at the congress. Naturally there were the customary vehement and wild speeches. But they were fewer than have been heard at some previous congresses; and there seemed a disposition to try to keep within the bounds of sanity.

It is possible, too, the circumstances of the labour world at the moment had some restraining influence. These large congresses are being held year by year; all the machinery of the trades unions and of the socialistic leaders is kept well-oiled; and labour questions were never more prominently discussed than now. But look around, and mark what has happened in the fields of labour represented by coal, cotton, shipbuilding, and railways. Over the whole organization (other than the National Free Association) of labour as now existing, there is written large the verdict "Failure." The work of the unions as ordered and conducted by their socialistic masters, has forced the employers into unions of their own, and thus has made the operations of the Labour Unions more difficult. To that extent it has weakened their own power, and rendered them less effective instruments in the cause of labour. Among the rank-and-file of the trade unionists, there is a growing insubordination, and the instances of this, and of violation of agreements entered into by their leaders, have become a positive terror to the latter. The Osborne judgment likewise dealt a heavy blow to the leaders and to those parliamentary representatives of labour who have been comfortably sitting in the enjoyment of a fixed income extracted, illegally by compulsion, from the members of the Trades Unions. The Osborne case involved the Unions in an expenditure of £8000; and that is not pleasant in view of the recent small yield of parliamentary enactment affecting labour. The yield there has been of late has done more to create disquietude than the short-visioned leaders imagined that it would. From all which, it is seen that the congress assembled last week in anything but a congenial atmosphere; and this the older and more sober-minded leaders recognize has been created more than anything else by the mating of socialism with the workers' unions.

The "JOURNAL" need not occupy itself much with the proceedings at the Congress. As has been said before in these columns, the industry's own workers are comfortable and contented. But the industry, being largely dependent for material and custom on other industries, it has an interest in the external labour factors that affect its own prosperity. Briefly, then, the President at the Congress (Mr. J. Haslam, M.P.), in his address, read a little homily to the insubordinates in the rank-and-file, upon the necessity for

discipline; for discipline and loyalty are at the root of the power of collective bargaining. He has no sympathy with those who break the laws of the Unions; but how can he expect the rank-and-file to obey the laws of their unions, when socialistic leaders are constantly inciting them to rebellion and to transgress the laws of the land. The resolutions passed at the congress were, as usual, voluminous; and they would, if in the main they were given effect to, be far-reaching in evil. Steps are to be taken to restore the "rights" removed by the Osborne judgment. How anything can be a "right" that is legally non-existent is not explained; but the leaders of the unions are careful to avoid any admission that what they have been doing they were not legally competent to do, though by not admitting it they infer that the Law Lords are wrong in their judgment. It has also been resolved to make an effort to get the Coal Mines (Eight Hours) Act amended, so as to enact that miners shall, from surface to surface, only be below ground eight hours during any consecutive twenty-four hours. A universal eight-hours day is again claimed. The Parliamentary Committee have also been instructed to promote a Bill for the nationalization of the railways. So we might go on, with little that is practical, and much that is impracticable, through scores of resolutions, many of which we shall hear nothing more about until the next Trades Union Congress. With a tithe of the matters referred to them to prosecute, the Parliamentary Committee would have quite sufficient work to do, though from it the harvest, for obvious reasons, cannot fail to be small.

The Advance of the Gas-Fire.

Apart from all external symptoms, there has been substantial proclamation in our columns during the past few weeks that the heating season is again at hand. This is the time at which we get in these pages a, so to speak, synopsis of the development accruing from the work of our gas-fire makers during the period lying between one heating season and another. In this department of gas heating, there is—and we welcome it, as all in the gas industry must do—a healthy rivalry between the makers. Not one of them can afford to show any inertia in the matter of progressive work. The domestic fire field for them, as it is for the gas-supply industry, is the biggest that remains to be conquered. It is a larger one, though only having periodical importance, than the gas cooking field. For house warming, gas is the ideal fuel. Eminent professors may appear before learned societies, and talk loftily of par-carbonized coal as a smokeless fuel; but such fuel is only a half-way stage in the general domestic economy to the fuel that creates no dust, and demands no—or rather the irreducible minimum of—labour on the user's part. With gas there is no ordering of fuel when once a meter is fixed, there is no creation of dust on delivery, no cellar required for storing it, no carrying of fuel from the cellar to the several rooms, no wood needed for ignition, no daily labour incurred in cleaning stoves and hearths and lighting fires, and that abomination to the housewife, the chimney sweep, has to find some other occupation. The par-carbonized solid fuels do not eliminate any of these disadvantages. But gas does. Therefore gas is the superior fuel. Again, the solid fuel that gives no flame is of very little use for oven work in ordinary kitchen ranges. The uncomplicated gas-cooker comes in there. For water-heating, too, there is the gas-boiler that can be connected up to the hot-water circulating system. Thus for the house, the gas-supply industry can offer the superior universal fuel.

Last heating season, the gas-fire had quite a little boom; and the makers were kept very busy (some of them day and night) in executing orders, though electricity at 1d. per unit for heating was being offered freely throughout the country. This coming season we hope to have reports of greater successes still. The boom of last season encourages the hope. It was the sign of public appreciation of the new order of things in gas heating. And when public appreciation attains the dimensions that it did last season, it may confidently be expected that the appreciation will not stand still, but will develop. With 40 million tons of coal used for domestic purposes annually, there is an extensive opportunity for gas; and the gas-fire is the means by which this huge monument to the barbaric usage of raw material may be reduced by transference of coal from the domestic grate to the gas-works retort. The makers of gas-fires are fully alive to this; and for some time past, there has been, on their part, a greater application of science in advancing the efficiency of their productions in this line. This year, too, we see the imprint on their work of the results of the investigation that is being carried out, through the Institution Gas-Heating Research Committee, at the Leeds University. The issues of this independent work prove both remedial and directive. Many structural defects are being exposed; and the directions of increased efficiency are being pointed out. If the Leeds University work had only the one result of stimulating energy in the competition for perfection, or if it had only the one result of suppressing inefficient goods, the reward would be a material one for the expenditure in money, time, and labour. The business for which we are aiming through the gas-fire is of such inestimable value, that there must be no economy in effort to secure it.

As we have just said, the gas-heating research work at the Leeds University, is making its impress on production. Every manufacturer is trying his utmost to get greater radiating efficiency. Before the last report of the Research Committee was submitted by Mr. E. W. Smith, M.Sc.—giving, among other matter, the results of the radiating efficiency of the gas-fires that had been under test—makers were already realizing 50 per cent. efficiency. The things of yesterday are not the things of to-day. There is, however, this season no radical departure to chronicle. The improvements in details which in combination produce higher result and more convenience, are things that count. But to be able to record 50 per cent. radiating efficiency, through improved regulation of gas and air and chimney draught, improvement in fuel and arrangement, and improvement in the internal construction of the body of the stove, marks a point in gas-fire history at which there may be gratification. The endeavour is to realize all possible advantage. There is, for example, a striking tendency to dispense with the fire-bars. The idea is not new; but when it was first advanced, it was looked at askance. Admitted that the fire-bars obstructed some small amount of radiation, there was doubt, on the ground of security, as to the wisdom of abandoning them. But the columnar "fuel" of the day enables, as will have been observed, the application of various locking devices—for instance, locking clips, top grooves and bottom sliding bricks, and nickel wire holders—to keep it in position. There is also now "reinforced" fuel; but there is a question in the minds of some as to the effect of the unequal expansion and contraction of metal and fireclay. But those who use the system, have made long and many experiments, and express their satisfaction. Then the locking of the "fuel" in position has the advantage of ensuring it being maintained in a central position over the nozzles of the burner. One firm add to safety by slightly inclining the fuel towards the back, and in association therewith claim a large radiating surface. It will be interesting to learn whether or not the inclination has any effect upon the direction of the radiations.

Instances are to be seen of still further elongation of the fuel beyond the point of active contact of the flame, on the ground that there must be a proportion of heat radiation from those parts of the "fuel" that are not actually made incandescent. Further attention has been devoted to the fire-brick—in one case, the waste products are caused to pass through the brick, so as to extract from them some of their heat; in another case, the slip brick has been made with a cavity on the rear side, in order to provide an air cushion at the back of the fire with the view of reducing the escape of heat at that part. There is an instance, too, of an interior design with the view of lessening the volume of cold air passing over the top of the fuel. The means of gas and air adjustment appear to have for a time exhausted ingenuity in this particular; but we find a safety gas-tap introduced to prevent accidental turning, and duplex burners are a feature of the season. Gas consumers want educating up to the usefulness of the duplex burner in giving them better efficiency from the gas consumed (when they only require half of the power of the fire) than can be obtained by the single burner, and merely reducing the consumption at the tap. In some examples, there are found new designs of canopies, with the view of obviating any escape of products on lighting up. The range of heating capacity is also being extended, by the production of wider fires. Interchangeability of all parts takes an important place in the consideration of the makers, as facility of maintenance is a matter of inestimable advantage to gas suppliers, with the growth of the gas-heating business. In external design and finish, manufacturers are studying more than ever the contem-

porary fashion in house decoration, furniture, and fittings in order to design fire casings that have an appropriateness therewith. And so as time advances, the peaks of efficiency, convenience, and suitability in the means of gas heating attain greater altitudes.

Gas Matters in Melbourne.

As was the case with the Australian Gaslight Company, whose meeting was reported a fortnight ago, the Melbourne Metropolitan Gas Company have naturally suffered extensively in their finances from the disastrous coal strike, which caused such havoc all through the Colony. Here, again, however, owing to the foresight and energy displayed by the administration, it was found possible to get through without any interruption to the maintenance of a full supply of gas; while no increase in price was made to the consumers. These are points upon which the Company and their customers are to be heartily congratulated. As will be seen from the lengthy report of the Melbourne Company's meeting which we give to-day, the Chairman (Mr. John Grice) devoted a very considerable portion of his remarks to dealing with a lot of attacks made on the undertaking by an influential local paper. A series of extracts from articles appearing over a lengthened period shows that the Board have good reason for complaint in this respect. All the Company ask for is fair play. This is not much; but it is evidently more than they can get in the quarter alluded to. In replying to the criticisms to which he had drawn attention, Mr. Grice was easily able to make out an excellent case for gas; and it is to be hoped that his facts and figures were given equal prominence locally to that which was accorded to the arguments in favour of electricity. The attacks on the Company from a financial point of view were also proved to be altogether wide of the mark; and altogether the Chairman may be complimented on the first-class "fighting" speech that he made. Conclusive statements of fact such as he was able to adduce cannot fail to impress those who approach them with an open mind, and give them the full consideration they deserve. Turning to the business of the half year, it is noticed that the quantity of gas sold shows an increase of 7½ per cent. over the corresponding period of 1909; but it was pointed out at the meeting that no doubt during the strike period, when coal was dear, more use was made of gas-cookers. A feature of the Company's operations is the increase in the number of persons using gas-stoves; and every effort is made to see that they are employed economically, so that satisfaction may be given to the consumers. Three lady demonstrators are engaged in visiting houses where stoves are installed, so as to show householders how to get the best value for their money. This is a step in the right direction; and it seems that it is properly appreciated. In spite of newspaper articles, the gas industry flourishes fully as well in Melbourne as we are accustomed to see it do elsewhere; and, with so energetic an administration as the Company possess, it will continue to do so.

Changes at Belfast.

The Corporation Gas-Works at Belfast having had an experience which is fortunately not uncommon in connection with the industry—namely, that of being in need of extension to cope with the continually growing demand for gas—consideration was given to the provision of a scheme that would meet the case. The matter was talked up and down; and at last the Gas Committee took the commendable course of calling in experts to advise them. Mr. Charles Hunt and Mr. W. R. Herring were the gentlemen chosen; and they were to be assisted by members of two local firms of Contractors. After careful consideration, they submitted a report, quite early in the year, which dealt with a number of questions on which the Committee were wishful to have opinions expressed. The report was to the effect that urgent need existed for making provision to meet future demands for gas, as even with the existing consumption operations were being "carried on with very considerable difficulty and some danger, owing to the extremely congested condition of the works." One thing which they pointed out should be kept in view was the fact that it would doubtless be more advantageous to eventually transfer the whole of the manufacturing operations to a new site than to attempt to modernize the existing works by reconstruction; and therefore they recommended the securing of a large site, upon which a works should be built in sections. Of eight suggested sites, the experts had no hesitation in recommending the adoption, as being eminently suitable for gas-works purposes, of one at the Twin Island. The report came before the Council at a special meeting, when it was resolved that this site should be selected, and "that the Gas and Law Committees be authorized to take the necessary steps to acquire it." This was in March; and it was calculated to convey the idea that the whole matter was then settled. Not so, however; for now, six months later, we have a full-dress debate at a special meeting of the Council, convened in pursuance of a requisition, as a result of which the resolution selecting the Twin Island site has been rescinded. Of what use is it to call in experts, if their advice is not going to be taken? And of what use is it to authorize the Committee to take the necessary steps to acquire a site, if the site is not to be bought? It must be confessed that there is some little difficulty in following the train of thought of the Council, though, at the same time, it has been long evident that there was in the city a sharp division of opinion on the subject. Over three columns of our news space to-day is occupied with a report of the debate—not anything like in full—and it will be seen that, after the previous resolution had been rescinded, it was unanimously agreed "that the whole question of the extension of the gas-works be referred back to the Gas Committee, with instructions to confer with Mr. J. D. Smith, the new Gas Manager, as to the possibility, with the adoption of modern machinery, of utilizing the present gas-works for some years to come." Here the question for the present must be allowed to rest; but, meanwhile, the members will probably ponder over the warning of the Lord Mayor, as to the probability that, if the matter were ever raised in Parliament on a Bill, "they would be referred back to their decision on the report of their experts."

The Glasgow Exhibition.

"No More Smoke!" Those are the most striking words on the front of the cover of the catalogue of the Smoke Abatement Exhibition that has been organized by the Glasgow Corporation, and is now being held in that city. "No more smoke!" The words arrest attention; and at once meditation starts as to what they really mean when considered in relation to the economies of our daily life and to the advancement of human happiness. The prospect is too extensive for passing reference; but the fact forces itself through even that sombre, heavy pall of smoke that one associates with Glasgow and several other large industrial cities and districts, and in lessened degree with most other centres of population, that Science has so far advanced knowledge, and the lessons have been applied in such practical way, that there is no occasion for the atmosphere of any city or town being transformed from a state of purity to a miasmatic condition in the necessary operation of obtaining heat or power for domestic or industrial purposes. This the Glasgow Corporation have accepted as a material and important fact. It should be so accepted by every local authority throughout the British Isles; and the magnificent example of Glasgow should be followed. If our local authorities would only grasp the simple truth that the sanitation of the atmosphere is of just as much importance as sanitation in other directions, they would set to work at once on a crusade similar to that undertaken in Glasgow—mainly through the instrumentality of the chief Corporation officials more immediately concerned in the question.

Educational Work.

Such a crusade must necessarily be educational in character. People are not to be forced from long-lived and indurated custom. They can only be led. An important contribution to the educational work in Glasgow was the classical report on the relative heating efficiency and contaminating influences of gas and coal fires—prepared by the Corporation Chemist (Mr. F. W. Harris), the Sanitary Inspector (Mr. Peter Fyfe), and the Chief Engineer to the Gas Department (Mr. Alexander Wilson)—which was published and commented upon in the issue of the "JOURNAL" for Jan. 4 last. Now the Corporation have followed this up by an exhibition (which will continue open until Oct. 8, and so will cover the visit of members of the German Association) at which the object-lessons are many—carrying proof that the heavy contribution of countless domestic chimneys to the pollution of the atmosphere is as unnecessary to-day as is the old stage-coach in locomotion. By the cordial assistance of the manufacturers in all

branches of modern smokeless heating appliances, the Exhibition Committee, and the organizing heads of the sections—Mr. Alex. Wilson (Gas), Mr. W. W. Lackie (Electricity), Mr. Peter Fyfe (Smokeless Fuel), Mr. S. B. Langlands (Lighting)—have brought together a show that far exceeds originally-formed expectations; and we most heartily compliment one and all upon it. Gas, electricity, smokeless fuels, and lighting all have their exponents of utility; but gas, it is acknowledged on all hands, has provided the most formidable section. The Gas Department of Glasgow has always done well for the city and district; and had it not been for gas having been supplied for domestic and industrial purposes at the low prices which have obtained, the atmosphere of Glasgow would in these times have been worse than it is. Let us mention just one direction of its effective work. There are 80,000 gas-cooking appliances in use in Glasgow. Supposing the work done by all these cooking appliances required the provision of heat by the combustion of the soft bituminous coals generally employed in Glasgow, it would represent a no mean contribution to the smoke contamination. The exhibition, we hope, will work wonders in forwarding the crusade in the main inaugurated by the Gas Department, and serve to modernize the views of both householders and manufacturers. All who are within convenient reach of Glasgow should take this opportunity of visiting an exhibition of which our Scotch Correspondent (see pp. 772-4) and others who have seen it speak in terms of the highest praise.

Experimental Gas Lighting in the City of London.

Considerable progress has been made during the vacation with the work of installing the various systems of high and low pressure gas lighting that are being experimentally fitted up for the Corporation of the City of London. The Gaslight and Coke Company, having obtained possession of the vaults under the northern approach to London Bridge, are busy putting down the new compressing plant that is to be used in connection with the Cannon Street centrally hung high-pressure gas-lamps fitted with lowering gear, as recommended by the deputation of the Streets Committee of the Corporation as the result of their visit to the Continent. The work of laying the new 6-inch steel main is already well advanced; the Company working night and day, as well as Sunday, on this work in King William Street and Cannon Street. Equally busy are the Company's contractors in fixing to the fronts of buildings the various attachments for holding the necessary suspension wires, services, winch boxes, &c., for lowering tackle; also in the thoroughfares where the ornamental brackets are to be fixed for the four-burner low-pressure inverted lamps —viz., Cheapside and Poultry. Naturally, much of this work has to be done during the night and on Sunday, to minimize the annoyance that would be caused to the occupiers in the heart of the City during the busy hours. At the present rate of progress, it is not unreasonable to expect that the whole of the new lighting may be finished before November; that on the northern approach to Blackfriars Bridge and New Bridge Street having already been completed.

A Weight-Driven Petrol Plant.

A petrol plant for lighting and heating, driven by a wound-up weight, in a manner precisely similar to a grandfather's clock, is now being manufactured by Messrs. Mansfield and Sons, of Derby Square, James Street, Liverpool; and the principle is found so satisfactory in operation that the firm are recommending it in preference to plants driven by a hot-air motor. The only attention required is the daily winding-up of the weight, which takes not more than five minutes, and can be done by anyone. These plants are absolutely automatic, starting themselves, accelerating themselves, and stopping themselves, according to the number of lights in use; while it is claimed that the quality of the gas made never varies, whether one or two lights or the maximum number for the apparatus are in use. It is, say the makers, a plant that can be depended upon to give the best effects; and at the same time it eliminates the great difficulty of selective evaporation of petrol. In fact, the aim of the Mansfield plant, and what it is guaranteed to accomplish, is the attainment of the very good results which can be depended upon for a definite quantity of air and a definite quantity of petrol which will vaporize without the troubles of selective evaporation.

Scottish Junior (Eastern) Gas Association.—The opening meeting of the session will be held in the Heriot Watt College, Edinburgh, next Saturday. In addition to the inaugural address of the President (Mr. Walter Dunlop, of Kirkcaldy), there will be a short address by Mr. J. Falconer King, F.I.C., F.C.S., City Analyst of Edinburgh. The programme of the session 1910-11 includes four business meetings, and visits to the works of Messrs. Henry Balfour and Co., and the gas-works at Leven, to the Bonnybridge Fire-Brick Works of Messrs. James Dougall and Sons, to the Fife Coal Company's Colliery, and to the Airdrie Gas-Works—jointly with the Western Section of the Association.

GAS STOCK AND SHARE MARKET.

(For Stock and Share List, see p. 792.)

AGAIN the apparently never-ending theme of our weekly review of doings on the Stock Exchange is—with almost exasperating iteration—a state of things approaching absolute inaction. And a remarkable feature of it is the cheerful tone which generally prevails in spite of it. Markets are in a condition of suspended animation; and if they do not rise, they do not fall. On the opening day, the tide was fairly favourable, though Consols gave way $\frac{1}{8}$. Railways were better, on hopeful views prevailing as to the labour embroglio. The Foreign Market, too, was strong; and Americans, doubtful at first, grew firmer later on. On Tuesday, the settlement was in course, and, being a light affair, caused no perturbation. The general tone was good. Consols rose $\frac{1}{4}$ on some little buying with cheap money; Railways brightened on good traffics and prospective pacification; the Foreign Market was firm; and Americans rose at the bidding of Wall Street. On Wednesday, there was some promise of rousing from the torpor. The tendency was good in most lines; and a feature of the day was the strength of brewery stocks. But on Thursday things fell back again into their old state of quiet, coupled with a weaker tendency. Consols fell $\frac{1}{8}$, Railways were dull, and many of the popular speculative markets were weak; but breweries were again in favour. On Friday, there was something of the usual Friday realization, which set the tide back here and there, but there was nothing at all pronounced. Saturday was dead-quiet. There was nothing doing; but no weakness supervened, and the little movement, such as it was, was for the better. In the Money Market, the supply was excessively abundant, frequently seeking employment and finding none. In the Gas Market, there was a fair amount doing in the aggregate; but it was nearly all confined to the three biggest issues, coupled with the South American. Everything was very firm, and quotations continued to advance. In Gaslight and Coke issues, the ordinary was very firm at from $105\frac{5}{8}$ to $106\frac{1}{2}$. In the secured issues, the maximum marked $88\frac{1}{2}$, the preference from $103\frac{1}{4}$ to $104\frac{1}{2}$ (a rise of 1), and the debenture from $80\frac{3}{4}$ to $81\frac{3}{4}$. South Metropolitan was firm at from $121\frac{1}{2}$ to $122\frac{1}{2}$; and the debenture was done at $79\frac{1}{2}$. In Commercials, the 4 per cent. changed hands at $105\frac{3}{4}$, the $3\frac{1}{2}$ per cent. at 103, and the debenture at $81\frac{1}{2}$. Among the Suburbans and Provincials, Alliance and Dublin was dealt in at 83 to $83\frac{3}{4}$, Brighton ordinary at 155 and 156, and South Suburban at 121. On the local Exchanges, Liverpool "A" changed hands at 216 (a rise of 3), and Sheffield "A" at 230. In the Continental companies, Imperial was active and firm at from 186 to $187\frac{1}{2}$, ditto debenture marked $92\frac{1}{4}$ and $93\frac{1}{4}$, Union 98 and $98\frac{1}{4}$, European $23\frac{5}{8}$ and $23\frac{3}{4}$. Among the undertakings of the remoter world, Primitiva was dealt in at from $7\frac{1}{4}$ to $7\frac{3}{8}$, ditto preference at from $5\frac{3}{16}$ to $5\frac{3}{8}$, ditto debenture at 98, and San Paulo at $16\frac{1}{4}$.

ELECTRICITY SUPPLY MEMORANDA.

Why Municipal Authorities and not Companies?—Tariff Principles—Terrible Fear of the Gas Expert—More Electrical Cooking Fancies.

CONTROVERSY continues around the London street-lighting contracts; the electricians seeking their hardest to minimize in the public sight the severity of the defeats encountered. But it is so difficult. They have to resort to evasion and distortion of facts. There is a very important fact that they avoid as much as possible. And it is the influence that municipal possession of electricity undertakings has upon this question in the majority of instances. The "London Observer"—an anti-municipal trading paper—has grasped the point; for it says "the fact that those local authorities which are not burdened with an electricity undertaking of their own are gradually substituting gas for electricity shows which is the more economical illuminant." Our contemporary might also have said that, in nearly all those boroughs in which the councils are not the owners of the electricity supply undertakings, the authorities have not been persuaded by the electricity supply companies that a change from gas to electricity would be an economical procedure. The Chairman of the Electric Supply Publicity Committee (Mr. H. B. Renwick) makes the point, in a letter he has addressed to the newspapers, that "only ten out of the twenty-nine London authorities are wholly without electric street lighting." The "wholly without," of course, suggests that some of those with electric lighting have precious little of it, and that the bulk of their lighting is still by gas. But Mr. Renwick would have sadly spoilt his point had he said that no less than fourteen of the nineteen electricity patronizing boroughs were the owners of the electricity supply undertakings, and that the Hackney and Bethnal Green Councils have put a stop to further progress in street electric lighting by entering for a term of years into a new contract for gas lighting. But if we add the ten boroughs to the fourteen possessing electricity undertakings, there are at once 24 boroughs accounted for out of 29. And if Mr. Renwick makes a close inspection of the returns of the London County Council, he will find five boroughs to make up the 29 with a number of electric street lamps of which he would not care to boast, in case some unkind critic produced the corresponding figures for gas. Thus it will be seen what a big influence ownership of the electricity

undertaking has upon this street lighting question. It would be an interesting study for those who have time to devote to it, to ascertain the reason why borough councils not owning electricity supply undertakings, and so being disinterested, cannot find any economy for the ratepayers in public lighting by electricity, while the councils supplying electricity think that they can, or say that they can. We fancy their economy is of the sort referred to in the "Memoranda" last week in connection with Marylebone; and in it all there is more than meets the eye through the medium of the figures published by the electricians. We may conclude this reference by pointing out that the number of street lamps under supply by the three London Gas Companies at June last was 77,349; while the County Council returns for 1908-9 show that the total number of electric arc street lamps in use in the administrative area (which is not, being somewhat larger, coterminous with the areas of the three London Gas Companies) was then 6574, and other varieties of electric lamps numbered 2641—a total of only 9215, against the 77,349 gas-lamps. Of the totals for electricity, 4859 arcs and 2429 of the incandescent type were in the municipal electricity supply areas. The figures for the electric lamps require some amendment, owing to the conversions from gas to electricity during the past year in Marylebone, Hampstead, and Shoreditch. But the figures for gas are absolutely correct up to June 30 last.

That perennial subject of discussion and heart-burning, the charges for electricity supply, had an innings before the Economic Section at the meeting of the British Association, in a paper read by Mr. E. W. Cowan—a paper which, through the lofty style of its author, requires a depth of investigation to get to the bottom of his reasoning. His contention is that electrical engineers blunder, and blunder seriously, in founding their tariffs for electricity on the cost of production, and particularly so when they endeavour to obtain equal profits from each class of custom. It would be too much of a "fag" to endeavour to penetrate the whole of Mr. Cowan's opacity; and so we take a few lines from the "Electrical Times," which attributes to the author the view that the mistake of electrical engineers is due to "their regarding electricity as a single commodity, whereas it is really light, heat, and power that they offer for sale. And each of these commodities has its own market value, determined not by the cost of production, but by demand." But although electrical engineers are charged with making this mistake, and, almost with common consent, reject the "principles" laid down by Mr. Cowan, when we make a comparison of some of the tariffs that come before us with the "principles" of Mr. Cowan, it is impossible to find that he has much to complain about. Turning to an abstract of the paper given in the "Electrical Review," we find illustration of what happens when regard is had for demand, and consideration for cost of production is set on one side: "Assume that the conditions of supply are such, in a supply works, that doubling the output would reduce the cost of production per unit by 25 per cent., and further assume that 1,000,000 units per annum are demanded for lighting purposes at 4d. per unit, and that the mean cost of production also amounts to 4d. per unit at that output, so that no profit is made by the undertaking. Then let us suppose that a factory within the area of supply offers to take another 1,000,000 units per annum at 2½d. per unit, under the same conditions in respect to the 'load factor,' 'diversity factor,' &c., as the existing supply. With the output doubled, the mean cost of production per unit will be reduced from 4d. to 3d., but only 2½d. is offered. Is this consumer's offer to be accepted at a price which represents a 'loss' of ½d. for every unit supplied to him? Under the maximum demand system he must be refused; and yet, if we figure it out, we find that an aggregate profit of 500,000 pence will be made by the undertaking with this customer on their mains, and, *ex hypothesi*, they can earn no profit without him." But supposing a few more factories spring up, requiring two or three million units per annum at the same price, how is the undertaking going on then? We have not the time to figure the matter out; but there is a lurking feeling that the principles of Mr. Cowan would not have any very gratifying bearing upon the ultimate financial success of the concern.

A laughable incident has occurred at a meeting of the Hastings Guardians; and it shows a curious twist in the economic ideas of these trustees of the public interests. The lighting of the workhouse and the cooking is now done by gas, and has been since 1903, when the house was built. The gas account comes to something like £280 a year. It has before been matter of comment in these columns that representation on local bodies (such as boards of guardians) by members of municipal authorities owning electricity plants does not tend to a fair consideration, from the points of view of economy and efficiency, of the question of the lighting of such establishments as workhouses, infirmaries, and some other public institutions. Attempts have previously been made to evict gas from the Hastings workhouse in favour of electricity; but the capital cost of wiring the institution has been found to be an obstacle. Now another effort is being made; and a member of the Corporation Electricity Committee who is a guardian, by the fairly positive statements that he advanced when the matter was under discussion by the Board, showed pretty conclusively that he had come to the meeting well primed by the Electricity Department to show what they were prepared to do. The question was discussed on a motion by Mr. Slack, that the matter be referred to the Building and Repairs Committee to obtain an estimate for wiring the place, and to inquire of the Town Clerk whether the Corporation would be prepared to supply electricity at the same cost as gas. Up rose Mr. Hill, a member of the Corporation Electricity Committee, and endeavoured to instil into the minds of his fellow members that the cost of wiring was a mere bagatelle. Supposing it cost the insignificant sum of £500 (which does not include the money spent on installing gas), interest and sinking fund would only represent about £40 a year; and it was just possible that the Electricity Committee would take £40 less a year than was now paid to the Gas Company. [Are we to understand that this would include cooking?] This is certainly municipal "management" with a vengeance.

So things looked simple enough; but another member of the Board (Mr. Hunter) dropped a fly into this beautifully prepared pot of ointment. He saw that the proper course, in the interests of economy, was to call in Mr. Botley, the Gas Company's Engineer, to see whether he could advise any improvement in the present system of lighting, combined with the realization of economy, in view of the advances gas lighting has made. But a majority of the Guardians were afraid of Mr. Botley, and had some notion that he would spoil the little plan devised in the interests of the Electricity Department. So they resolved to dispense with Mr. Botley at this stage. This is funny. There is the whole place piped for gas; and the Guardians have no knowledge whether or not additional efficiency and economy can be secured from the existing installation. The influence of the Electricity Department so overpowers them, and over-rides their sense of duty in relation to the guardianship of the poor-law purse, that they must ascertain first (and preferably only) what electricity can do for them. That is the position. But before the Guardians commit themselves to anything, it is hoped they will throw off the electrical shackles, recognize their responsibility as an independent public authority, and open the matter of lighting to fair and unfettered competition between the Gas Company and the Electricity Department. There was also some talk respecting the "safety" of electricity at the Guardians' meeting. We have heard of a few extinctions of the electric light at Hastings; and the Guardian who used that word "safety" cannot surely have been carefully reading his newspapers since last Christmas, or certain tragic occurrences would not have escaped notice. While the Guardians are waiting for the reply of the Corporation Electricity Department, peradventure they may find something to interest them in a report of a Departmental Committee appointed by Mr. John Burns to inquire into (*inter alia*) this matter of the lighting of poor-law institutions. The report was dealt with in the "JOURNAL" for March 9, 1909 (pp. 679, 700).

An article copied from an American source on "Cooking and Heating by Electricity" has been published by the "Electrician." The author is Mr. P. A. Bates, and, in the course of his writing, he makes use of the usual extravagances of the electricians. Among other of his "facts" is this, that it has been found that, with the ordinary gas range only 15 per cent. of the heat produced is usefully applied, while, with the various high-grade electrical cooking devices now obtainable, 70 per cent. or more of the heat produced is utilized. Judging by recent correspondence in our electrical contemporaries, of high-grade electrical cooking devices—adopting the laconic information contained in a famous chapter on snakes in a certain country—"there are none." The 15 per cent. efficiency of gas ranges is absurd. But supposing it were true, taking a unit of electricity at 1d., and 30 cubic feet of gas purchasable at 1d., the 15 per cent. would exceed in useful B.Th.U. the 70 per cent. ascribed to electricity. Taking gas-fires, certain of our makers have so far improved these that 50 per cent. of the heat developed is now given off in the shape of radiant heat, a smaller percentage as convected heat, and the balance escaping up the flue, and partially necessary for creating a draught, has been considerably reduced. But to return to electrical cooking, the advantages stated by Mr. Bates are: Rapidity with which food may be—not can be—cooked, uniformity of the temperature obtained (which makes cooking by the clock a possibility), comfort and convenience, cleanliness, freedom from smoke and smell, and food free from all gas or odour. There is a big field over here in which Mr. Bates could profitably exercise his talents in advising the manufacturers of electrical cooking appliances. What a pity it is they do not invite him, and make it worth his while to come, over here to aid them. But, after reading all that Mr. Bates has so far said, an astonishing thing is that in America "there are few noteworthy installations; and of these the number that have been tested with the view to obtaining exact and useful information as to actual performance is astonishingly small." We wonder then whence Mr. Bates got the information which enables him to speak so positively. As to the taint from gas fumes, we have seen electrical engineers make a good square meal off gas-cooked (and in the electrical imagination, gas-tainted) food; and they have looked very comfortable afterwards. A large proportion of the 40 to 50 per cent. day load of gas undertakings is represented by the consumption of cooking-stoves, and at lighting prices too. The people of this country must surely be fond of gas-tainted food. Is it not time that electricians dropped their ridiculous talk on this subject?

For the position of Manager of the Rochdale Corporation Water-Works, rendered vacant by the resignation of Mr. W. T. Tomlinson, after forty years' service, 91 applications have been received. The salary offered is £250 per annum, rising to £350 by four annual increases of £25.

OBITUARY.

JAMES STELFOX.

Those connected with the gas industry, among whom he was widely known and deservedly much esteemed, will learn with deep regret of the death of Mr. James Stelfox, M.Inst.C.E., who for over thirty years held the position of Manager of the Belfast Corporation Gas-Works, with—to quote the words of a resolution unanimously passed by the Council—credit to himself and profit to the community. Born at Salford (where his father was Gas Manager) in 1842, Mr. Stelfox was in his 69th year. After his retirement in 1906 on a substantial allowance, he was laid aside by illness, as his friends know, for a long time; but he had apparently quite recovered from this, and his death (which took place at his residence, "Delamere," Chlorine Gardens, Belfast, last Sunday week) was somewhat sudden and unexpected. On the Saturday morning he was about as usual; but during the night he became ill, and subsequently had an apoplectic seizure—passing peacefully away about midday.

In 1852, his father—Mr. James Stelfox, sen.—was appointed Manager at the Belfast Gas-Works, then the property of a private Company, with headquarters in Leicester. Under his direction, the works prospered more than ever they had done before. The undertaking remained in the hands of the Company until July, 1874, when it was taken over by the Corporation; the terms of purchase having been arranged in the previous year. On the transfer, Mr. Stelfox, sen., was continued in the office of Engineer and Manager; but he had intimated to the Corporation that he would only hold the position temporarily, and when he retired the following year his son was selected to fill the vacancy. The new Manager was by no means a stranger to the duties which thus devolved upon him, as he had for many years been associated with his father in the control of the undertaking. Beginning his connection with the establishment at the age of sixteen, immediately after leaving the school which he had attended in High Street, he was, while still quite a young man, deputed to act as accountant and book-keeper, and later was appointed general assistant to his father. In the latter capacity, he acquired a great deal of knowledge that he turned to good advantage when he was entrusted with the chief control of the works.

Everyone who knew the deceased will agree that all his work was characterized by thoroughness and ability; and it will be admitted that the success which has attended the Gas Department was largely due to his wise supervision. One of the most important changes made during his managership was the introduction of carburetted water gas. This step was taken some sixteen or seventeen years ago, at a time when the large increase in the demand for gas had led to very great congestion in the works, and the difficulty of securing a site for suitable extensions was severely felt. Mr. Stelfox was confident that the manufacture of water gas would prove effectual as at least a partial relief; and the result of the experiment was satisfactory. He devoted a great deal of time to superintending the carrying out of the project. It was also during his tenure of office that prepayment gas-meters were introduced into the city; the first of these having been fixed on Jan. 20, 1904.

Mr. Stelfox's wife (who won golden opinions during the time of the Gas Institution meeting in Belfast, when her husband was President some dozen years ago) died about nine years since; but he is survived by three sons and two daughters. In addition to his engineering qualifications (which led to his being elected a member of the Institution of Civil Engineers in 1896), Mr. Stelfox was an ardent naturalist; and he found his principal recreations in photography and microscopy.

It was announced that the funeral was to be of a strictly private character.

PERSONAL.

The Directors of the Derby Gas Company have decided to allow their Engineer (Mr. J. Ferguson Bell, M.Inst.C.E.) to take private practice, from which he has hitherto been restricted except under special circumstances; and they have appointed Mr. W. E. Caton to be Assistant-Engineer.

Mr. John Chapman Mount has tendered his resignation as Borough Surveyor and Water Engineer to the Lancaster Corporation; and it will come before the Council at their next meeting. Mr. Mount was trained under Mr. Creer and Mr. John Cook, now Engineer to the Fylde Water Board. He succeeded Mr. Cook in 1902.

Wales and Monmouthshire District Institution of Gas Engineers and Managers.—The next meeting of the Institution will be held in the Gas Offices, Newport (Mon.) on Wednesday of next week. The proceedings, which will open at 11 o'clock, will include the Inaugural Address of the President (Mr. J. H. Canning) and a paper by Mr. T. Canning. It is also intended to consider, and if approved pass, the rules of the "Special Purposes Section," and receive a report on the proposed evening classes. At the close of the meeting, the members will adjourn to luncheon at the Savoy Hotel, on the invitation of the Chairman and Directors of the Newport Gas Company; and a visit will afterwards be paid to the Crindau Gas-Works, under the direction of the Engineer, Mr. T. Canning.

A NEW WEST-END SHOW-ROOM.

No one who "knows his London," in these days of motor omnibuses, tubes, and other means of conveyance, will be inclined to question the accessibility of Oxford Circus, and therefore its convenience as a position for a gas apparatus show-room. In addition to this, the neighbourhood has another and even greater advantage for the purpose named—it lies in the very heart of the shopping centre. Hereabouts the ladies throng; and it is, of course, the ladies who are likely to have more to say in the matter of gas-stoves than anyone else.

These considerations led Messrs. R. & A. Main, Limited, to take some very extensive premises at No. 25, Princes Street, W., which are situated within a stone's throw of Oxford Circus itself. Handsome show-rooms have here been fitted up, which will afford ample scope for the proper display of the firm's numerous specialities. Besides the ground floor area available, which measures about 70 feet long by 22 feet wide, there is a large window space so arranged as to afford an unobstructed view of all the goods shown. In fact, the insurance people state that the window is the biggest piece of plate glass they have ever insured. The polished floor and oak fittings set off to advantage the array of gas cookers, fires, radiators, &c., which are the occupants of the show-room; while a roomy basement is available for the larger apparatus which is suitable for hotels, restaurants, clubs, hospitals, and so forth. Downstairs, also, quite a fine workshop is being fitted up, so that repairs can be promptly undertaken. A large private office is to be found on the ground-floor; and upstairs there is a comfortable, top-lighted drawing-office. In a gas show-room, of course, artificial lighting is an important point; and it is one that Messrs. Main would not be likely to neglect. There is in position a fine installation of Bland burners; and the whole of the front of the building will later on be lighted by means of high-pressure lamps, for which purpose compressors and a gas-engine are to be installed. Street and other lamps will be fitted in the basement as well, so as to demonstrate their capabilities.

Under the courteous guidance of Mr. A. P. Main, a representative of the "Journal" was last week able to assure himself that the scheme laid down will admit of the best possible use being made of the ample accommodation available. In the show-room proper, hidden flues have been fixed so that eight gas-fires can be seen in operation at one time; the whole of the products of combustion being carried away into the chimney. Four of these are on either side of a "St. Nicholas" grate-fire, which has an attractive polished steel and brass setting; and an inspection of this, naturally led Mr. Main to speak of the firm's latest departures in the heating line, an illustrated description of which will be found in another column, under the heading of "Simplicity in Gas-Fires." The "St. Nicholas," to which may first be devoted a word or two, is not absolutely a newcomer, as it was introduced last year. It is, however, quite new enough, and successful enough, to deserve special attention. Its success was manifested by the fact that at the Dundee Gas Exhibition—the first place where it was shown—no less than 320 were sold in one week. The "St. Nicholas" adapts itself to any modern grate interior; and no fitting is required. The existing bars of the grate are simply lifted out, the gas-fire pushed into position, the supply connected, and the fuel correctly laid. No burner is visible; and the similarity to a coal-fire is enhanced by the fact that the top layer of fuel is black. It is perhaps hard to understand why anyone should prefer the appearance of a coal-fire to that of a gas-fire; but such people do exist, and for them the "St. Nicholas" is a boon and a blessing. As the result of considerable experiment, the exact angle has been settled at which the fuel should be placed for making the gas draw right through to the back of the fire from the vertical nozzles. The fuel projects well in front of what would be the case were coal being used in the grate; and the fire is very low down—which is regarded as a big point with the public nowadays. There is a simple gas and air adjustment, and the burner is reversible; while a boiling-trivet and a toaster may be attached to the fire if desired.

Leaving the grate-fire type, attention was drawn to the new "D. S. O." series of gas-fires, the main features of which will, as already mentioned, be found outlined elsewhere. Realizing the need for cheapness in popularizing the gas-fire, the firm have in this series reduced the number of castings to two—the fire itself and the flue-chamber at the back—and the design has been made as simple as possible, though, of course, ornamentation can be added if desired. They are absolutely barless; and interchangeability is not a feature, as there is nothing to interchange, and no screws to undo. It was a nursery fire that Mr. Main had at hand when explaining the advantages of this new series of stoves; and he pointed out that, if objection were taken to the open front, a detachable brass fire-guard could be supplied. There is a boiling-burner at the top, and a filling-in plate for placing over the burner when it is not in use. Emphasis was also laid on the reversible burners and the simple form of air adjustment. The patent fuel extends from the fret right up under the canopy. A good flue is thus created; and the fire has a finished appearance. Another thing is that the fires are absolutely adaptable to any standard make of long fuel, should gas undertakings be possessed of stocks that they desire to use up. But naturally the firm recommend their own fuel, which has been designed to secure certain definite objects. The fuel is so tilted that if broken it would not fall forward; but this tilting has a further object—inasmuch as it has a

tendency to bring the flame, going up, to the front of the fuel, where it is wanted. But there is another important feature besides the fuel. Mr. Main mentioned that, in the course of the discussion at the last Institution meeting, the question of getting the very best results from the new type of fires was brought up; and attention was drawn to the importance of the canopy in this respect. The ordinary canopy would be open in front to catch the fumes. One speaker, however, pointed out that, with a fairly strong chimney draught and a wide open canopy, a large quantity of air would be drawn across the front of the incandescent fuel, thus cooling the fuel. To meet this objection, there is added to the patent fuel a patent brick, which forms a hot-air chamber behind the canopy. The products of combustion are led up through the fuel into this brick. The flame is thus given time to do its work, and the heat is not drawn away up the flue.

LABOUR DISPUTES DURING 1909.

It cannot be claimed that Labour is failing just at the present time to get its fair share of attention in the public Press. If anything, one would be inclined to say that the opposite was the case; but then it must be remembered that big issues are at stake. The Labour leaders are dissatisfied with the law of the land; the members of the Trades Unions are dissatisfied with the leaders; and the employers are dissatisfied with the actions of their men. The result in the three cases respectively is agitation, insubordination, and retaliation. Strikes and lock-outs are once more the weapons of which the disputants are evincing a disquieting readiness to make the fullest possible use. The end is yet to come; but, meanwhile, as the subject is so much to the fore, the appearance of the report of the Labour Department of the Board of Trade on Strikes and Lock-Outs in the United Kingdom during 1909 (which is signed by Mr. G. R. Askwith) may be considered opportune. It is the twenty-second volume of the series; and it deals also with the work of the Conciliation and Arbitration Boards. Notice of the latter may be left to another occasion; the strikes and lock-outs of last year will be sufficient to take note of in the present article.

The result of a dispute which involves a cessation of work, is impossible to calculate with absolute exactness, as the immediate outcome (whether it may be the gaining of their point by the masters or the men) may be far more than off set by temporary or permanent effects of the trouble on the trade concerned. For once in a way, the principal cause of disputes last year was not wages, but hours of labour. This, of course, was owing to the interference with previously existing conditions which arose from the operation of the Mines Eight-Hours Act. Of the 170,258 workpeople directly involved in the disputes commenced in 1909, 87,367, or 51 per cent., were concerned in disputes on questions of hours of labour. In the nine preceding years the question of wages was the most frequent cause of trouble; but the proportion of wages disputes has varied considerably—falling as low as 49 per cent. in 1902, and rising to nearly 79 per cent. in 1908. Last year, the proportion was only 25 per cent. Disputes as to the employment of particular classes of persons were more numerous in 1909 than the previous year. The majority of the workpeople engaged in them were in the coal-mining industry, and were concerned in questions arising out of the suspension or discharge of fellow-workers. Disputes on details of working arrangements (about three-fourths of the people involved in which were in the coal-mining industry) were about the same in number as in the preceding twelve months, but involved fewer workers. Troubles arising out of refusals to work with non-Unionists, and other questions of Trade Union principle, showed little change. Of the 12,935 employees directly connected with these disputes, 78 per cent. were engaged in the coal-mining industry—nearly all being in South Wales and Monmouthshire collieries, where for years past, as the report points out, a continuous effort has been made by the South Wales Miners' Federation to compel all non-Unionists to join that body.

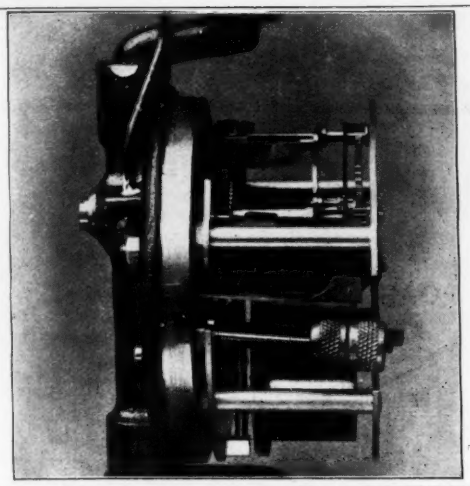
An interesting table is that which shows to what extent the disputes of the year were settled in favour of the employers or the workpeople, or were compromised. In disputes arising on questions of wages, the striking feature is the small proportion of workpeople who obtained complete success—whether seeking an advance in wages, resisting a proposed reduction, or disputing on any other points that affected wages. Only 10 per cent. of the workpeople involved in these disputes were completely successful, while 41 per cent. were entirely unsuccessful, and 47 per cent. effected compromises. In disputes regarding hours of labour, the great majority of the workpeople involved were, as already remarked, connected with the branch affected by the Coal Mines Regulation Act, in most of which cases amicable settlements were effected between the parties. In troubles arising out of questions of Trade Union principle, the great majority of the strikers were successful; but, as usual, in a number of instances the disputes were between one body of workpeople and another, and not between employers and employees. In all other classes of disputes, the balance of success was on the whole against the workpeople, who were completely successful as regards only 15 per cent. of their number, while 52 per cent. were unsuccessful, and 32 per cent. effected compromises. Taking all the disputes of the year together, the report says, it is found that only 11·2 per cent. of the workpeople directly involved were completely successful in attaining their object; and this proportion would be materially reduced if disputes concerning the employment of non-Unionists (which do not usually concern the employers to the same extent as other disputes) were excluded. The proportion of workpeople who were unsuccessful was 22·2 per cent., and of those who effected compromises 66 per cent. The proportion of workpeople successful in the previous year was about 3 per cent. smaller than on this occasion, and that in favour of the employers greater to the same extent—the percentage compromised remaining practically the same. From these figures, it would seem that there should be no difficulty in arriving at the conclusion that the strike is a hazardous weapon to employ. The chance of success is, on the whole, smaller than the risk of failure; while when the result is a compromise, it could doubtless often be truly urged that a similar end might have been attained without the adoption of such extreme measures.

The total number of disputes which began last year was 436, as compared with 399 in 1908, and 601 in 1907; but though the number was thus substantially larger in 1909 than in 1908, the total workpeople involved was only about 5000 more—the persons directly and indirectly concerned being 300,819. The workpeople indirectly involved are those thrown out of work at the establishments where the disputes occurred, although not themselves on strike or locked-out. Workpeople indirectly involved at other establishments than those at which the disputes occurred are not included. The aggregate duration of all the disputes in progress during the year amounted to a little more than 2¾ million working days. The number of workpeople involved was the highest since 1894, the year of the general strike in the Scottish coal trade. This increase was largely due to the stoppage of work which occurred in a number of the principal coalfields, consequent on the failure mutually to adjust conditions of working when the Coal Mines Act of 1908 was put into operation. In fact, of the 300,819 workers involved in all the disputes of the year, 49 per cent. were idle through this cause. Fortunately, the disputes were short; and as there were no other serious stoppages of a general character, the aggregate duration of all the disputes in progress in 1909 amounted to little more than one-quarter of that recorded for 1908, when there were great disputes in the engineering, shipbuilding, and cotton trades.

The proportion of the total number of workpeople employed in the various industries who were involved in disputes last year (though the highest recorded since 1894) was only 2·9 per cent., as compared with a similar figure in 1908, and 1·4 per cent. in 1907. The proportion was highest in the coal-mining industry, where it amounted to 26·5 per cent., and was lowest in the building trades. As stated above, the mining and quarrying industries in 1909 accounted for the greatest number of workpeople involved in disputes—over 90 per cent. of the workpeople engaged in all the disputes of the year being in these industries. Apart from the Mines Act disputes, there was a considerable increase in the numbers involved in coal-mining disputes in 1909, as compared with the six previous years. Other industries were comparatively free from disputes; this being specially marked in the metal, engineering, and shipbuilding trades and in the textile industries, in both of which groups the figures were the lowest on record. The aggregate duration of all the disputes in progress in 1909—2,773,986 working days—was less than one-thousandth of the whole number of working days available for the industrial population, exclusive of agricultural labourers and seamen. Thus, when spread over the entire industrial population, the amount of working time lost owing to disputes in the year 1909 was only about one-quarter of a day per head. In the coal-mining industry, the average loss of time was about two days per head of those employed; while in the metal, engineering, and shipbuilding trades it amounted to only about one-eighth of a day per head. The majority of the disputes were, as usual, of short duration—42 per cent. of the 436 disputes which began in 1909 having lasted less than a week, while the proportion lasting less than a month was 74 per cent. Of the 2,773,986 working days lost in 1909, the mining and quarrying industries accounted for 80 per cent.; while the duration of disputes in those industries was, with the exception of 1902, the highest in the past decade.

Coal-mining disputes were responsible for a loss of 2,168,508 working days, and other mining and quarrying industries 60,979 days. Of the 207 disputes in the mining and quarrying industries which began in 1909, wages accounted for 124, hours of labour for 16, employment of particular classes of persons for 22, working arrangements for 21, Trade Unionism for 9, and miscellaneous causes for 15; but in the 16 hours-of-labour disputes more than one-half of the total number of men affected by stoppages were concerned. Of the nine "Trade Unionism" strikes—probably all arising through refusal to work with non-Unionists—seven ended in favour of the men, and two were compromised. Altogether, in these two industries, the proportion of workpeople successful in the disputes beginning in 1909 was 10·2 per cent., unsuccessful 19·4 per cent., compromised 69·8 per cent., and indefinite or unsettled 0·6 per cent.

Association of Engineers-in-Charge.—At the annual general meeting, the Chairman (Mr. A. E. Penn) was able to give a very satisfactory account of the Association from all points of view; and he announced that the President-elect was Captain H. Riall Sankey, whom they all knew so well and held in such high esteem. When the time came for taking up his position, they would, he said, find Captain Sankey with an excellent address.



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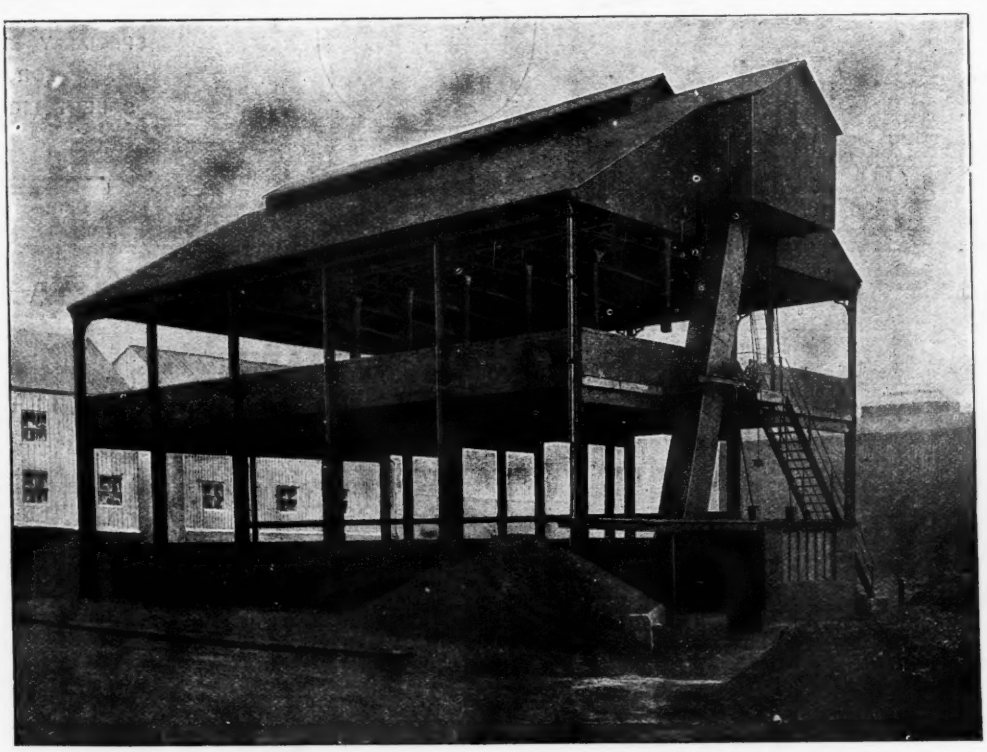

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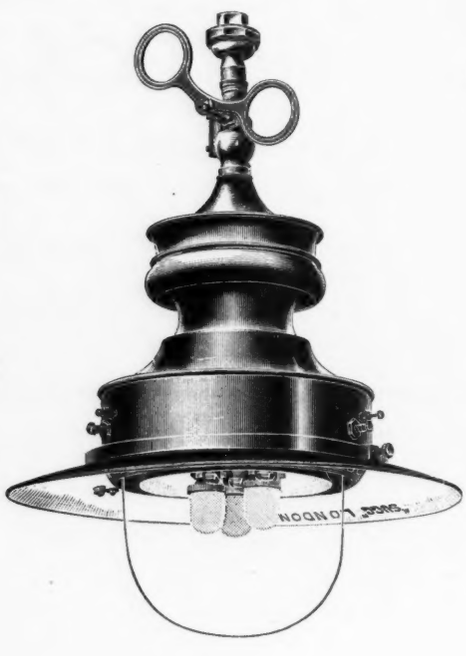

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TRADES UNION CONGRESS.

Meeting in Sheffield.

FOLLOWING close upon the meeting of the British Association in Sheffield, the Trades Union Congress this year assembled in the same city—after an absence from it extending over 36 years. It was the forty-third annual gathering; and at the opening session in the Victoria Hall, on Monday of last week, there were 501 delegates present, representing 1,700,000 members. Generally speaking, the questions figuring on the *agenda* for consideration were much of the same character as those which we have been in the habit of seeing discussed at these meetings. But an incident in connection with the very outset of the proceedings gave rise to excitement. The Lord Mayor of Sheffield (Earl Fitzwilliam) having, it appears, had a lock-out of the men at his Elsecar Collieries, and having refused to negotiate with their leaders—the Yorkshire Miners' Association—the Congress Reception Committee felt they could not accept his hospitality as Lord Mayor. For some days previous to the congress, negotiations were proceeding; and it was not until the eleventh hour that the officials were able to announce that the Earl had receded from his original position, and had agreed, if the trouble could not be settled without arbitration, to negotiate with the Miners' Association. This made it possible for the Committee to adhere to the arrangement proposed, under which the Earl was to officially welcome the congress to Sheffield and subsequently to entertain the delegates at a reception. This programme was duly carried out amid general satisfaction. It is true that two delegates left the meeting as a protest; but we do not gather from the Press reports that they were greatly missed. "Sweet reasonableness" is not invariably an outstanding feature of Trades Union policy; and thus one is the more ready to acknowledge the good sense shown by the vast bulk of the delegates in regard to the welcome and reception of Earl Fitzwilliam, when he had consented to an arrangement which was perfectly acceptable to the men directly concerned. The congress having been opened, a large part of six days was spent in discussing matters, practical and otherwise. We have heard most that was said before; but a new programme cannot be expected every year, while so much of the old ones remains unfulfilled. The Osborne judgment was, however, somewhat of an exception, and as such the most was made of it.

Naturally the chief item in the first day's proceedings was the address of the President, Mr. J. Haslam, M.P., who began by referring to the existing unrest in the Trades Union world, and sounded a warning to which heed will have to be given in some quarters, if the whole fabric of Trade Unionism as it now exists is not to be brought to the ground. He pointed out that the principle underlying the Trade Union movement was that of collective bargaining; and they must do all they could to maintain the power of collective bargaining, which, on the one hand, demanded recognition from the employers, while, on the other, it equally demanded confidence in the leaders of the Trade Unions and the officers of the various organizations. They must urge upon the members of the different Unions the absolute need for loyalty and discipline, if their word, and their bond, and their agreements were to be respected. On the subject of the decision of the House of Lords in the notable Osborne case, the President's remarks were very much as might have been expected. So long, he said, as this decision remained the law of the land, their work would be hindered, and the full effects of organization would not be realized. Right along from the year 1872, when the first two representatives of Labour were elected to the House of Commons, to the decision in the Osborne case, the Trade Union world had no other idea than that it was one of their objects, not only to work for, but to maintain in Parliament Labour men representing the Trade Union forces of the country; and from 1874 onwards the funds of Unions had been applied to the purpose of paying and returning members to the House of Commons. They would gather from this that at least from a moral point of view no members of the Unions could claim that the money had been paid in ignorance. Every member of a trade organization ought to have known that it was part and parcel of the work of their Union. Even those who had taken action against the Amalgamated Society of Railway Servants had themselves, by their conduct, proved conclusively that they had no objection to Labour representation so long as it was of a character which they themselves approved of. For years and years these men were content to pay for Labour representation; and it was only when, through the formation of the Labour Party some ten or eleven years ago, the forces of Labour as representing the Trade Union movement and the Independent Labour Party were brought together, that objection was taken. So far as the costs were concerned, this one case would take from the funds of the Unions something like £8000. About £3000 of the amount would be borne by the railway servants themselves. The remainder—amounting to almost £5000—would have to be borne by the Affiliated Unions of the Labour movement, and levies would be made in order to defray it. In addition to this case, the many injunctions which were now being sought were costing the Unions in some cases hundreds of pounds, and in his view unjustifiably, because in no single case had a Union embarked upon Labour representation without receiving instructions from members by ballot-vote—in almost all instances with overwhelming majorities in favour of the principle. "My view," he continued, "is that nothing short of the reinstatement of the Unions' position previous to the Osborne decision can be accepted. For nearly fifty years, Trade Unionists have carried on this work, not only with advantage to ourselves, but to the country as a whole. Subjects affecting the workers, organized and unorganized, have received the attention of parliamentary representatives; and I claim that the influence of Labour in Parliament has been for the good of the community."

The report of the Parliamentary Committee, the discussion of which was the main business on the second day, contained a statement which may be said to amount to an assertion that promises have been more plentiful than performances in the way of Labour legislation since the present Government came into power. On the other side, "Labour has experienced, through the Courts of Law—and by no means for the first time—one of those periodical attacks which it is accustomed to receive from those whose duty it is to hold the scales of justice evenly; the decision in the Osborne case being an undisguised attack on the hitherto unchallenged right of the Trade Unionists to engage in political work and to send forward and maintain representatives in the House of Commons. As in the past, so in the future, must Trade Unionists assert themselves by active and vigorous efforts to regain the freedom of engaging in political action, of which, for the time being, judge-made law has deprived them." The concluding paragraphs of the report were of a decidedly optimistic character: "In the event of what is known as the 'conflict between the two Houses' being settled in a satisfactory manner, thereby avoiding another appeal to the electorate, the coming session should be productive of much good so far as the interests of Labour are concerned. Your Committee gladly welcome the determination of the Government to press forward and pass during the Autumn Session the Shop Hours Bill, which it is estimated will affect about two million workers. Opportunity will be taken to press forward the Labour Party's Bill dealing with unemployment as drafted by the Joint Board, and with the proposals for dealing with invalidity and unemployed insurance promised by the Government, having for their object the completion of the scheme of which the establishment of Labour Exchanges was the first instalment. Your Committee may naturally, and with some degree of confidence, anticipate being in a position to chronicle this time next year that considerable progress has been made in securing for the workers some of those remedial measures of which they stand so much in need, and towards the realization of which Labour's representatives will assuredly work zealously and without cessation."

When it was suggested that the Osborne case should have an early place in the discussions, one London delegate had the temerity to state that this matter was not of overwhelming importance, and that the vast majority of Trade Unionists were in favour of the judgment. Naturally, however, this did not meet with much approval among those present. The Salvation Army having been once more castigated (by word of mouth) in regard to alleged sweating in their joinery and other works, the Parliamentary Committee were appealed to to obtain from Mr. Haldane a clear expression of opinion that, under no circumstances, should the force of the Territorial Army be used against workers in the case of disturbances arising out of trade disputes; and it was decided that some more specific assurances should be sought. The musicians and variety artistes having appropriately had a "turn" with a resolution protesting against the introduction of "seven-day labour," and other matters of particular interest to the former of these two branches, motions were submitted with regard to the proposed unification of the whole of the Labour forces of the kingdom. One resolution, which was carried, suggested the advisability of considering the possibility of determining all industrial agreements on a given date in each year. Mr. Ben Tillett, on this subject, said he wanted something to be done to bring the forces of Labour much closer together than at present. They had seen the Miners' Federation become a great force, and the engineers also; and the whole tendency was in the direction of unification. The development on the Capitalists' side had been much more swift and effective than on the Labour side; and he wanted congress to commit itself to the principle of federation. He looked forward to the time when the whole of the Trade Unions would be so well organized that they could terminate work on the same day; for they could not fight the Capitalists in sections. Several sections of Labour were threatened at the present time; and employers would always be able to use the bludgeon, and lock-out, so long as the various sections of Labour were divided. Another proposition, which was also agreed to, was to the effect that the present sectional Trade Unionism was unable to successfully combat the encroachments of modern Capitalism, and that the existing Unions should be amalgamated by industries, with one Central Executive elected by the combined Unions, with power to act unitedly, thus making the grievance of one the concern of all. As to this, one speaker thought sectional Unions should be abolished, because employers could easily deal with them as long as they were in sections; while another exclaimed that it was "amusing to see the number of tinpot Unions there were."

Early in Wednesday's proceedings, the following resolution was unanimously agreed to: "That, in view of the impossibility of dealing successfully, in any one year, with so many reforms as congress usually approves of, it be an instruction to the Parliamentary Committee to select from the motions passed by congress two or three which are of general importance, that special

attention be given to these reforms, and that, if necessary, an agitation be raised by the Committee with a view to educating public opinion regarding them, and so making their immediate acceptance more likely. Further, that the Parliamentary Committee in this policy co-operate, as far as possible, with the Labour Party." The acceptance of this view, looks something like a confession of failure of the hitherto existing methods. Next a motion was carried, amid applause, condemning the practice of international importation and exportation of workmen to act as "blacklegs" during trade disputes, and urging the Government to prevent the practice in the United Kingdom. The mover of this asserted that Britishers were the worst offenders. Railway amalgamations were also condemned; but, somewhat singularly, almost in the same breath, approval was expressed of the principle of railway and canal nationalization. The day's speech-making was considerably enlivened by the outspoken remarks of two American delegates, the gist of whose speeches was that the grievances of the workers in the States are very much like those which we are accustomed to find voiced in this "effete old" country of ours.

The Osborne judgment came in for much debate on the following day. It is impossible here to deal with the speeches—which were sometimes lively—but we may note that one delegate was suspended, while another, amid some confusion, was heard to describe Mr. D. J. Shackleton, M.P., as a "swashbuckler." The resolution, which had previously been taken back by the Parliamentary Committee, "to be strengthened," was finally carried by 1,717,000 votes against 13,000. As will be seen, it was of a somewhat comprehensive character: "This congress desires to register its emphatic protest against the judgment given in the Osborne case, involving, as it does, the prevention of effective parliamentary representation by organized labour; makes it impossible for Trade Union branches to join in the work of local Trades Councils; strikes at freedom of discussion and resolution which has always been enjoyed by the Trades Union Congress in so far as congress has taken action of a political character in the interest of the wage-earner. This decision denies the right of Trade Unions to carry out their nominal statutory purpose of 'regulating the relations between employers and employed,' in so far as modern conditions of industry and the highly organized state of capital render parliamentary action necessary for this purpose. It deprives Trade Unions of a freedom which they have enjoyed for nearly fifty years, and which they have exercised only with the approval of their members and to the advantage of the community. This congress claims: That these rights be restored at once, so that Trade Unionism may be put in a position to fulfil its statutory functions in such a manner as the members of the respective Unions according to their rules shall decide. Therefore, having regard to the injustice of the decision, and to the urgency of the matter, congress calls upon all affiliated organizations, in view of the misrepresentations of the position which have appeared recently in the Press, to bring all possible pressure to bear on the Government to provide, at once, facilities for the passing into law of the Bill, as presented by the Labour Party, to reverse the judgment; and determine to make it a test question at all parliamentary elections."

A motion was agreed to in favour of the Trades Disputes Act being amended so as to make it illegal for any employer, during or pending a strike or lock-out, to house any person or persons, other than the caretaker and his family, in any premises which have not been duly approved and certified, prior to such strike or lock-out, for use as a dwelling-house. The delegates having showed their sympathy with the suggestion that the law should be altered to provide for the payment of members of the House of Commons and their official election expenses, the Labour Exchanges came in for much unfavourable attention. Among a heap of other resolutions agreed to were several for improving the working conditions of miners; and the "cruel and inhuman system of evicting workmen and their families from their houses during trade disputes" was condemned. Education had a considerable amount of time devoted to it; and the congress agreed to the establishment of a central Legal Defence Fund; the object of such fund being to meet the legal costs incurred by affiliated Unions in carrying to the highest legal court any test-case affecting the fundamental principles of organized labour. The Parliamentary Committee were instructed to prepare a report on the various existing forms of conciliation and arbitration in industrial disputes, both British and foreign. The principle of an eight-hour day received approval, as did a suggested amendment of the Workmen's Compensation Act in numerous very important respects. The Government were also called upon to pass the "Right to Work" Bill; and the question of State insurance came in for attention.

At last, however, the delegates separated, after having decided to meet next year in Newcastle.

Institution of Municipal Engineers.—The North-Western District Section of the Institution of Municipal Engineers will visit the Bolton Corporation Water-Works next Saturday afternoon, by permission of Mr. L. Mitchell, the Borough Water Engineer. The party will meet at the Bolton Town Hall, and leave there for Ferns Park, to view the mechanical filters. Then they will go to the Heaton reservoirs and filters, on to Sweetloves reservoirs, and afterwards to the new Delph reservoir works, now in progress.

SMOKE ABATEMENT.

Interesting Exhibition in Glasgow. Opened by Lord Pentland.

[From our Own Correspondent.]

An Exhibition, promoted by the Corporation of Glasgow, and having for its object the education of the community in the use of smokeless fuels, was opened in Glasgow on the afternoon of Friday last by Lord Pentland, Secretary for Scotland. The exhibition is located in the Victoria Skating Rink, in Victoria Road, near the Eglinton Street Station of the Caledonian Railway. The building is an extensive one, having a floor-space of 18,000 square feet; and some idea of the magnitude of the exhibition may be formed when it is stated that the estimate of the Manager is that the exhibits aggregate a value of £20,000. There are sixty-six exhibitors, of whom thirty-three show gas appliances, ten are devoted wholly or partially to electrical appliances, and twenty-two to solid fuels. Of the exhibitors, thirty-two belong to Glasgow; eight to London; twelve to England outside London; seven to Scotland outside Glasgow; and one is foreign.

Though the place is not so arranged, the exhibition naturally classifies itself into the three divisions of (1) what can be done in the way of using solid fuels to minimize the output of smoke; (2) what can be done by gaseous fuels; (3) what can be done by electricity?

Of the first class, the most numerous displays of apparatus are those in which anthracite is used as the fuel. Of more general importance are a few exhibits in which ordinary coal is used. In the fires and ranges of the Whiteflame Fire Company, of Stirling, the principle is that behind the brick which forms the back of the fire is a hopper filled with coal, and the coal which is being consumed is raked out from below the bottom edge of the brick. A day's supply of coal is fed into the hopper at a time, the coal gets thoroughly dried in the hopper, and when it reaches the fire-well, it burns with a clear, bright flame—almost smokeless. A somewhat similar arrangement is shown on the stand of Messrs. W. Kemp and Co., of Glasgow.

There is one prominent exhibit illustrating what can be done by the use of ordinary coke to provide for cooking and heating. This is upon the stand of the Ferrybridge Foundry Company, Limited, of Ferrybridge, Yorkshire. The apparatus is known as the "Howmatash." As shown, it is consuming coke supplied from the Glasgow Corporation Gas-Works. The red glow of the fire is visible; the heat continuously given out, available for use in both cooking and heating, is enormous; and the combustion is so slow that, at the Glasgow price of 9s. per ton, an ordinary room can be kept warm for fifteen hours for not more than 2½d.

In two exhibits, coal preparations are put forward. One of them is to be found upon the stand of Coalexld Limited of Lancaster. The substance resembles a superior variety of coke. It is produced in the Glasgow Corporation Gas-Works—a chemical being used in its preparation; and it is shown in the furnace, burning freely and without smoke. The cost is said to be only half that of the best coal.

Another preparation of much the same sort is charco, shown by Charco Limited, of London. It consists of coke, treated as it comes from gas-retorts or coke-ovens, and is represented as giving 43 per cent. more radiant heat than before treatment, while, it is said, undesirable chemical compounds—such as volatile hydrocarbons, arsenic, and sulphur—are eliminated.

Among the solid fuels may be noticed peat, which is shown by the Glasgow Distress Committee; the material being brought from their colony at Palacerigg, near Cumbernauld. It is being burned in a grate specially made by Messrs. R. & A. Main, Limited, and is represented as "an almost smokeless fuel," and "the fuel *par excellence* for a drawing room." While this may be so, the odour from the fire is very strong, and not altogether pleasant.

Geographically speaking, the exhibition is almost equally divided; the northern portion being occupied by gas, and the southern portion by electricity exhibits; the solid fuel exhibits being found in both sections. On entering, the visitor finds himself between two large white structures, the one of which is known as the Corporation Gas House, and the other the Corporation Electricity House. In these two erections are to be found focussed all that is elsewhere shown in the Exhibition.

The Gas House is a dwelling-house without the outer walls, the absence of which enables the visitor to see the interior arrangements without entering. In the dining room, there is a Carron fire, and "Telephos" gas lighting by Messrs. James Milne and Son, Limited, which can be controlled from any part of the room. The kitchen has been furnished with a Wilsons and Mathieson's "Deighton" range, which has the oven on the same level as the gas cooking burners, and at a height more convenient for being seen into than is usual. The space below, which is occupied by the firebox and the oven in coal-ranges, is a receptacle for pots and pans; and an attendant has ingeniously placed in front of it an ordinary asbestos gas-fire, the glow of which gives a cheerful appearance to the apartment. There is a Wilson "circulator," for the supplying of hot water to radiators in the different rooms; a Wright's "Sun" boiler, for the supply of the bath in the bath room and the troughs in the laundry; and a "Hot-well" boiler for the service of the kitchen sink. A "Glasgow" cooker, with Richmond plate rack and hood, a vegetable steamer, hot plate

pastry tablet, and coffee roaster, are also shown connected. In the bathroom is fitted a large enamelled bath, with Ewart geyser; towel rails, one warmed by hot water and the other by a gas-burner within it; and a washhand basin with a Ewart's "Gem" instantaneous water heater. The bedroom is a dainty apartment. It is heated by a Main "St. Nicholas" gas-fire, and lighted (as are the laundry and the bathroom) by Messrs. M'Innes and M'Lachlan, of Glasgow; the lighting including a conveniently placed reading-lamp fitted with an inverted incandescent burner. On what may be termed the verandah of the house are shown a variety of gas appliances and utensils, such as cookers, boilers, fires, and the like, all of which may now be obtained from the Corporation on the hire-purchase system.

The house is without a chimney. Every part of the service in it is rendered by gas. Visitors have provided a demonstration of how efficiently a dwelling may be lighted and warmed by gas appliances; while the suitability of gas for cooking purposes is made manifest by demonstrations which are given by the attendants. The advantage of using gas is well brought home by a placard, upon which is pointed out that, in capable hands, breakfast, dinner, and tea for a family can be cooked by a consumption of 85½ cubic feet of gas, which, in Glasgow, costs 2d. It may be mentioned that the hire-purchase system of supplying gas appliances came into operation on Friday, and that under it articles may be hired at rates varying from 2s. 6d. to 30s. a year—payments to be made three times in the year, and the total payments to be in twelve equal instalments.

The Gas House is the product of much study on the part of the Gas Engineer (Mr. Alex. Wilson) and his staff, upon whom the task lay to make a selection of the appliances most suitable for an ordinary household. It is imaginable that the difficulty would lie, not in the finding of suitable articles for selection, but in the necessity there was for rejecting many articles that might well have found a place, had space permitted. It will be generally admitted that the selection which has been made is one which is capable of illustrating how much more comfortably as well as economically a householder can get along when he gives up the use of raw coal and makes the gaseous products of coal his servant. That the public may see the matter in the same light will be the object and the duty of the attendants.

The Corporation gas exhibit forms the head of two long lines of stands which are occupied by appliances for the utilization of gas in the forms of heating, cooking, motive power, and lighting. A finer display of gas appliances has seldom, if ever, been seen. All the leading manufacturers of goods for use with gas are represented, most of them upon stands of capacious dimensions.

Messrs. R. & A. Main, Limited, on one of the largest stands, show, among other wares, their D. S. O. series of fires, which are placed before the public for the first time here. The makers claim that this series is the embodiment of all the elements combining cheapness with efficiency and good appearance; and they point with pride to the fact that it was the first gas-fire selected by the Corporation of Glasgow to be sold on the hire-purchase system. The fires have a beautiful majolica enamel finish.

To fully describe the goods shown by Messrs. Wilsons and Mathiesons, Limited, of Leeds, would require more space than is available. The firm, it may be recalled, were exhibitors in the first great gas exhibition in Glasgow—that of 1880, which was held in Burnbank Drill Hall, and which was also a gas and electricity exhibition. In the water-heating appliances of the Leeds firm, a cubic foot of gas raises a gallon of water to 160°. It is claimed that 97½ per cent. of the heat applied is absorbed by the water. In their gas-fires the makers are introducing fittings for the delivery of the gas to the burner on the Venturi tube principle, which is found to be of great advantage. A regenerative reflector is shown in front of an ordinary gas-fire, by means of which heat which would otherwise be lost upon the floor is deflected into the room, increasing the radiant heat in front of the fire by, it is claimed, as much as 30 per cent.

Messrs. Fletcher, Russell, and Co., Limited, of Warrington, in preparation for the season, have brought out a number of new gas-fires, among which may be mentioned the "Palermo," the "Borneo," and the "Tokyo." As usual, they have an interesting display of laboratory and workshop appliances.

The Carron Company are exhibitors of some large goods, among which may be mentioned a roasting oven suitable for hotel service, capable of cooking from 250 lbs. to 300 lbs. of meat at a time. They have a series of four sizes of the "Glasgow" cookers, for the manufacture of which they are the sole contractors to the Corporation. These are supplied by the Corporation of Glasgow on the hire-purchase system, at annual rates of 4s., 6s., 8s., and 10s., and are fixed free by the Corporation.

The Parkinson Stove Company, Limited, the Davis Gas-Stove Company, Limited, and the Richmond Gas Stove and Meter Company, Limited, have all very large, interesting, and up-to-date exhibits.

Messrs. John Wright and Co., of Birmingham, have improved upon their fire-clay fuel by the introduction of a new and patented variety known as "Thermo X," by which heat radiation is very greatly increased; the increase being due to the shape and the position of the back brick as well as to the composition of the "radiants." They have also brought out a new patented adjustable flue outlet, which permits of the nozzle being adjusted at any angle, to suit different types of chimneys, and by which up-draught is accelerated. The "Hygeia" trivet burner for nursery use, placed at the side of the fire, is claimed to be an advance upon the method of fixing a boiling burner on the top of the stove. The firm also show a patented "Unitap," which takes the place of the old arrangement in the case of duplex burners, which required two separate taps. In this tap, successive movement of the plug admits the gas to the whole or any part of the fire as required. The "Garajo" boiler, shown by the firm, is a dome-shaped gas-heated boiler for hot water circulation, all of cast iron, specially constructed for heating motor garages, greenhouses, &c. The boiler has no internal parts or interspaces to get choked up. It has no automatic valve, but is constructed so as to do its work with so very small a proportional gas consumption that the gas supply is made a fixed quantity—safeguarded against fluctuation from varying pressures by an ordinary governor.

Among other exhibits in the Gas Section which may be noted are the following: Messrs. James Milne and Son, Limited, have an assortment of gas meters, gauges, &c.; the Automatic Light Controlling Company, Limited, who show "Gunfire" controllers; Messrs. G. Bray and Company, Limited; J. & W. B. Smith, of London; and the Ramie Company, Limited, of Bredbury, who occupy stands displaying lighting appliances; Messrs. Peebles and Co., Limited, of Edinburgh, upon whose stand are seen the Company's appliances for governing gas supplies, a pressure balance distance gas-lighter, and the patent inverted gas-burner of Mr. Alex. Wilson, of Glasgow, in two sizes, one for the lighting of stairs and courts, giving, with three-quarter foot of 16-candle gas per hour, a light equal to 12 candles, and a larger size for use in workshops, ship yards, &c.; Clark's Syphon Stove Company, Limited, of London; the Pharos Light; the Ovee Light Company, of Manchester; and the James Keith and Blackman Company, Limited, of London, whose gas compressing plant is employed in the lighting of a portion of the exhibition.

In the Gas Section coal gas is paramount; the only instance observable of any other variety of gas being used being upon the stand of Messrs. M'Innes and M'Lachlan, of Glasgow, where an installation is shown of the "Empire" petrol gas plant.

As in the gas so it is in the electricity department, the first exhibit is a house which is wholly served by Corporation electricity. Differing from the Gas House, the Electricity House has outer walls, and the visitors all walk through the building, having the appliances described to them *en route*. There are no fireplaces; all the heating being done by Murray radiators, parabolically fixed, which are to be found below furniture or against the walls in different parts of the rooms. The lighting is by all the known methods, excepting the arc lamp. In the entrance lobby, the ancient device of the holophane globe, believed by some to be a new application, is employed to diffuse the light. In the bedroom is shown, besides the ordinary lighting, over the head of the sleeper, a bed lamp which can be turned down, and a bedside food warmer. The bathroom contains a "Therol" water heater, which serves the laundry as well. In the laundry the work of ironing and dressing garments, by means of electrically heated irons, goes on almost continuously. The kitchen is shown as a working one. It contains an oven and several heaters, which are fitted with double heating arrangements—a high and a low. In the case of the oven, the high heat is stated to consume two units of electricity per hour. The "Therol" water-heater is said to pass continuously current at the rate of one-fifth of a unit per hour, and to be capable of delivering 30 gallons of water per day at 110°, or 9 gallons of water at 212°. In general, it is claimed, both in the "house" and upon outside stands, that by the use of electricity, 15 gallons of water may be boiled by means of a penny-worth of current.

Upon the numerous stands in the exhibition most attention is paid to lighting. Of industrial devices most is made of ironing appliances, in connection with which perfection seems, in the minds of electricians, to have been reached when it was discovered that, with the heating arrangement inside the iron, it is possible, by turning the utensil upside down, to use it as a cooker. The arrangement strikes the visitor as an ingenious one; but somehow admiration for the ingenuity and adaptability of the device cools rapidly when it is stated that the iron, stand, and fittings cost 21s. Cooking is carried on upon one or two stands; Messrs. Malcolm and Allan, Limited, of Glasgow (among others), showing the efficiency of the "Tricity" range.

The lighting of the exhibition is under the charge of Mr. S. B. Langlands, the Lighting Inspector for the City of Glasgow. The arrangement of the gas installation is: Central passage, two of Messrs. James Milne and Son's "Sunlight" lamps; Outside passage, nine of Keith and Blackman's 1500-candle power lamps; Inner passage, four 1600 and four 2200-candle power lamps of the Ovee Light Company; round the Gas House, three "Pharos" lamps of 2000-candle power each; and outside the exhibition, five "Pharos" lamps of 4000-candle power each, and three Graetzin street lighting combined lamps and standards. Lighting by electricity is confined to the interior of the exhibition, and the arrangement of it is: Central passage, five 10-ampere magazine type flame arc lamps, "Angold," of 2500-candle power each; Inner passage, five 10-ampere flame arc lamps of 2500-candle power each; and round the Electricity House, eight Osram lamps of 1000-candle power each.

The opening ceremony took place in the presence of a large and distinguished company.

Councillor D. M. Stevenson, who presided, called attention to the aims of the Corporation in holding the exhibition. What they wished to do was to try and improve the atmosphere of the city, as they had been

improving their river. Historians told them that Glasgow used to be a *rus in urbe*—a little model garden city, with its Cathedral at the one end, and a pure river at the other. They were trying to make a pure river again; but the atmosphere they had in the old days (the sunshine and the clear blue sky) were things very much of the past. What they wanted to do now was to try to bring it back. The progress of civilization was very much the undoing of the evil results of the various steps in that very progress. In this connection, in Glasgow, after having taken the necessary sanitary steps to give them public health, they had to set about a sewage scheme to get the river back to what it used to be. In the same way, industry in Glasgow had given them a smoky atmosphere; and now they were setting about trying to purify it. But not only were the industries the sinners in this respect. The whole city was; and it was chiefly in regard to domestic evils caused by atmospheric pollution that the exhibition was being held. Those who had already passed through the galleries must have seen that there were numberless appliances for making it possible to have a pure atmosphere in the city. The appliances there were almost entirely directed to domestic uses. There were the latest and most modern appliances for cooking and heating under smokeless methods, by gas, electricity, and smokeless fuel. The Corporation were hopeful that the citizens would try to take advantage of these methods, and help to restore to Glasgow some of its ancient prestige as a beautiful city as well as a great industrial centre.

Lord Provost M'Innes Shaw expressed the pleasure he had in being present at the opening of so interesting an exhibition. The question of air purification had been discussed for many years; but nothing definite had hitherto been done to focus attention upon the methods and processes by which the evil might be ameliorated. During the past twelve months, however, the public conscience had awakened to the desirability of successfully tackling the question, particularly with reference to large centres of population, where the health of the community was of primary importance. He was glad the Corporation of Glasgow had taken this rightful place in this matter; for nowhere in the British Empire could such a question be more appropriately dealt with. Their city, from its nature, was one of the offenders in the matter of the pollution of the air. They might not wish to minimize this nuisance if it were to have the effect of curtailing industrial and commercial enterprise. But they had come to a stage when it was possible that these industrial and commercial enterprises could aid them in the matter, without in the slightest degree militating against their success or development. The object of the present exhibition was to show by what means all classes of the community could assist in the purification of the air. It was extremely gratifying to know that in the organization of the exhibition, the Commissioners had had the co-operation of manufacturers of appliances for lighting, cooking, heating, and power, as well as of smokeless fuels, all over the kingdom; so that the citizens, in whose interest the exhibition had been projected, would have a unique opportunity of studying the great question, and of comparing the various methods and processes which had been devised to cope with this clamant problem. They expected great things as the result of the exhibition. So far as the Corporation were concerned, they were determined that they would leave no stones unturned to make the city sweeter and purer, by the elimination of unnecessary smoke from the air. He therefore appealed to the citizens to support the Corporation in their present effort, by visiting the exhibition in large numbers, inquiring into the merits of the various processes, and adopting one or other of the many inventions to be seen there. Councillor Stevenson had asked him, on behalf of his Commissioners, to declare the exhibition open; but they had Lord Pentland present with them that day, and he (the Lord Provost) would like very much to be allowed to transfer this function to his Lordship, whom he had great pleasure in introducing to them.

Lord Pentland said he could only assure those present that it was with great pleasure he fell in with the wishes of the Lord Provost. The subject which this exhibition was intended to illustrate was nothing more nor less than the health and the working power of the great community of Glasgow. There might be obstacles to overcome before the object which the exhibition was designed to attain could be achieved; but the whole history of the development of Glasgow was a conquest over obstacles in the path of development. Everything that they knew of Glasgow and her citizens gave confidence that when they were informed upon a subject, when they knew what the object was, and could see it clearly, they would, as sure as anything, achieve it. The exhibition, he understood, was designed to instruct, and to show them how great the economies were which were in their power, if they used the proper methods. He was not sure that the delightful weather they were experiencing was quite the best time in which to impress upon the citizens the need for these appliances; but they and he, who knew Glasgow at other times of the year, knew well that nothing could lift a greater load from off the industries of Glasgow than to purify its atmosphere, and to relieve it, even from the point of view of health, from the gloom which often overtook it on winter afternoons. If they could lengthen the daylight, they would lengthen the working power of the day. He felt sure that the citizens would support the Corporation in the efforts they were making, and that not only employers but householders would recognize that, in organizing this exhibition, the Corporation were doing a thoroughly public-spirited and beneficial thing. He had the greatest pleasure, at the bidding of the Lord Provost, in declaring the exhibition open, and in wishing that many might profit from the sights they would see there.

Bailie Paxton, the Sub-Convener of the Gas Commissioners, in moving a vote of thanks to Lord Pentland and the Lord Provost, said that, in the matter of air purification, they felt that it was time that talking should cease, and that something tangible should be offered to the public. The Gas Committee had been working strenuously, and not without success, since it was instituted (he thought in 1869) to forward the movement. As the Lord Provost had said, the public conscience had quickened during the last twelve months. This had brought directly to the Gas Commissioners the question of what they were going to do to help the public to purify the air. The Town Council had not gone so far as he would have liked in this direction. They were being led, in this connection, by smaller towns in the neighbourhood. In Paisley, they were giving gas grills, stoves, and meters free. This statement also applied to other towns—including Dundee; and he was assured that the giving of these gas appliances, in the various towns, was paying the corporations, in the profit which they made on the sale of gas. It was time, therefore, that they in Glasgow should do something to press forward the question.

Councillor W. P. Smith explained that the origin of the exhibition was a motion by Mr. Stevenson that the Gas Department should hold an exhibition to show the latest appliances for heating and cooking by gas. But it at once became apparent that they ought to enlarge the scope of the exhibition, and include in it all smokeless methods of heating. The exhibition now represented the attitude of the Corporation towards the prevention of the pollution of the air by smoke from domestic chimneys. The Corporation asked the citizens to come to the exhibition, and to judge for themselves as to which method of heating they preferred. They wished the citizens to consult their own ideas and their own questions of taste, so long as they chose some form of heating which was smokeless, in order that they might have better health and a more beautiful city. He proposed a hearty vote of thanks to the Chairman, as the originator of the idea of holding an exhibition.

The vote was cordially given, and acknowledged by Mr. Stevenson.

At the close of the opening ceremony, Lord Pentland was conducted round the exhibition by the Lord Provost.

AWARDS AT THE BRUSSELS EXHIBITION.

From the complete list, which was published in "The Times" last Thursday, of the awards to British exhibitors at the Brussels Exhibition, we extract the following names in the classes in which "Journal" readers are more particularly interested.

Mathematical and Scientific Instruments, &c.: Silver Medal—John J. Griffin and Sons, Limited, London; Townson and Mercer, London.

Medicine and Surgery: Grand Prix—John J. Griffin and Sons, Limited, London. Gold Medal—Fletcher, Russell, and Co., Limited, Warrington.

Steam Plant: Gold Medal—National Gas-Engine Company, Limited, Lancashire; Sturtevant Engineering Company, Limited, London.

Other Kinds of Engines: Grand Prix—Crossley Brothers, Limited, Manchester; Pump and Power Company, Limited, London; Campbell Gas-Engine Company, Limited, Halifax; Power Gas Corporation, Limited, Stockton-on-Tees. Gold Medal—National Gas-Engine Company, Limited, Lancashire. Bronze Medal—Reavell and Co., Limited, Ipswich.

General Machinery: Grand Prix—Appleby Crane and Transporter Company, Limited, Glasgow; Pump and Power Company, Limited, London. Diploma of Honour—Reavell and Co., Limited, Ipswich. Gold Medal—Aerograph Company, Limited, London; Sturtevant Engineering Company, Limited, London.

Implements and Processes Used in Rural Cultivation: Gold Medal—South Metropolitan Gas Company, London.

Metallurgy: Grand Prix—Glenboig Union Fire-Clay Company, Limited, Glasgow.

Metal Working: Diploma of Honour—Fletcher, Russell, and Co., Limited, Warrington.

Apparatus and Processes for Heating and Ventilation: Diploma of Honour—Fletcher, Russell, and Co., Limited, Warrington. Gold Medal—John J. Griffin and Sons, London.

Apparatus and Processes Employed for Lighting other than Electric Lighting: Gold Medal—Gas Economizing and Improved Light Syndicate, Limited, London; Reflector Syndicate, Limited, London; C. C. Wakefield and Co., London. Silver Medal—Ropley, London. Bronze Medal—John Dugdill and Co., Manchester.

Applied Chemistry and Pharmacy: Grand Prix—British Cyanides Company, Limited, London; Curtis's and Harvey, Limited, London; Gaslight and Coke Company, London; Power Gas Corporation, Limited, Stockton-on-Tees; South Metropolitan Gas Company, London. Diploma of Honour—Fletcher, Russell, and Co., Limited, Warrington; John J. Griffin and Sons, Limited, London; Townson and Mercer, London.

Exhibitors Placed Hors Concours: Cambridge Scientific Instrument Company, Limited (Mathematical and Scientific Instruments, &c.).

Our contemporary remarks that the list of awards shows the quality of British exhibits to have been very high.

Eastern Counties Gas Managers' Association.—As already announced, the forty-fourth general meeting of the Association will be held at Cambridge next Friday. Members and friends will assemble at the gas-works (which will be opened for inspection at 12 o'clock noon), and will be afterwards conveyed to the University Arms Hotel, where, on the invitation of the Chairman and Directors of the Cambridge University and Town Gaslight Company, they will be entertained at luncheon. The business meeting will be held in the new Lecture Room at Emmanuel College, at 3 o'clock, and will consist (in addition to formal matters) of the Inaugural Address of the President, Mr. J. W. Auchterlonie, and a lecture by Mr. J. B. Peace, M.A., on "Theory and Practice in Engineering." Subsequently the members will dine together at the Lion Hotel.

"MAIN" D.S.O. FIRES

Illustrated on this page mark a distinct advance upon the style of Gas Fires hitherto manufactured. They are supplied in two sizes, finished in any style of ornamentation, and for beauty of design, simplicity of construction and heating efficiency are beyond comparison.

THE "DEPENDABLE."

No. 1131. 10-in. fire.
18/-

THE "SYMMETRICAL."

No. 1133. 10-in. fire.
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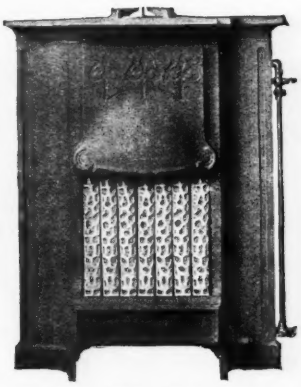
THE "ORIGINAL."



No. 1135. 10-in. fire.
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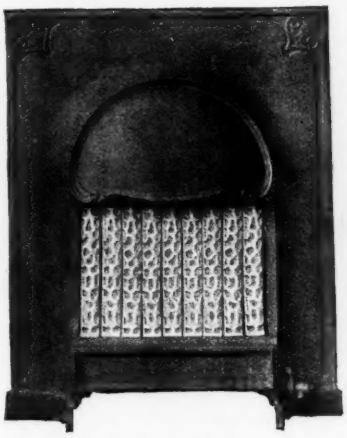
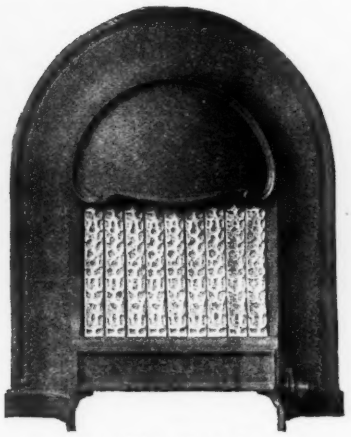
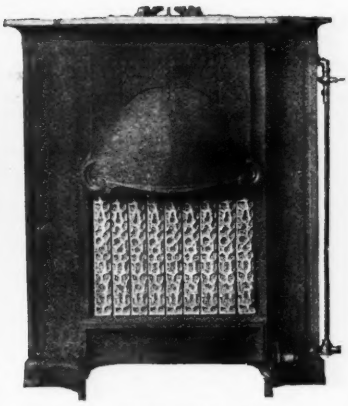


No. 1132. 12-in. fire.
29/-



No. 1134. 12-in. fire.
29/-



No. 1136. 12-in. fire.
30/-

Being fitted with our New Patent Fuel (see advertisement in issue of September 6th), and constructed with the minimum number of loose parts as illustrated last week, these Fires have rightly gained for themselves the title of the "Distinguished Service Order" of Fires.

Fire Bars eliminated. *Greatest Efficiency obtained.*

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REDUCE YOUR

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That of Horizontals without excessive Capital Outlay by using

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Has now been in continuous operation for over Nine Months, giving results **exceeding** those that can be shown by any other system of carbonizing.

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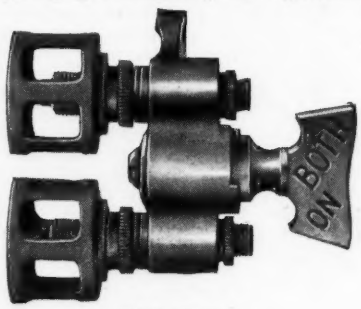
RICHMOND'S GAS-FIRE IMPROVEMENTS.

WHERE high efficiency already exists, the more difficult is it to add to it. This is what the Richmond Gas Stove and Meter Company have found in connection with their "A," "B," "C" ("Arabian," "Bavarian," and "Castilian") series of gas-fires; and although several improvements (tending to additional efficiency, economy, convenience, range, and style) have been made latterly in preparation for the forthcoming season, it speaks highly of the careful consideration that was given to the scientific and practical lines of design prior to the introduction of the series three years ago, when it has to be said that it is found hard to introduce improvement. In other words, though the firm have remodelled what may be called the brick and fuel of the fires, and generally brought everything up to a higher pitch of perfection, they have



Duplex Burner.

not had to alter, or even found it necessary to alter, any part of the general features of the series. Now this may to the lay mind suggest non-progress. But it is nothing of the kind. When a level of perfection has been reached co-equal with contemporary ideas and knowledge, there must come a pause; and headway can only be made in detail. Except, therefore, in respect of details, to-day finds the "A," "B," "C" series intact as introduced three years ago.

"Egyptian," Copper Sheathed.

"Egyptian," Brass Sheathed.

But there are new points to notice. New sizes in the series have been found necessary to meet the growing demand for gas-fires for the heating of larger rooms and for their quicker heating. This is a point that is coming very much to the front. The efficiency and conveniences of gas heating are attracting more and more public attention; and there is not an inconsiderable class of gas consumers who do not mind paying for what they want if only they can get it. They are generally the occupiers of houses containing large apartments. And if they can have gas-fires that will rapidly heat those apartments, they thereby derive greater satisfaction; and do not cavil at all at paying for the luxury, which, of course, involves a heavier consumption of gas. The previous three designs of the series (the special feature of which is—supplementing high efficiency—the interchangeability and facility of maintenance) comprised twelve sizes. Now the designs of the series have been brought up to five; and the sizes to eighteen. This has been done by the addition of a fire with a 16-inch fire opening of the "Arabian," "Bavarian," and "Castilian" types, and of a high-class gas-fire named the "Egyptian," in the 13 and 16 inch sizes. In these new types, as in all the others, every fire is interchangeable one with the other; this being a feature with which popularity, convenience, and economy to gas suppliers, will not allow the firm to dispense. Its value, in short, is such that it cannot be over-estimated from the maintenance standpoint. Upon the enlargement of this series, the Richmond Company are to be congratulated.

An improvement and extension of convenience in connection with this larger series of fires is the adaptation to all patterns, without affecting their interchangeability, of a new duplex burner, which allows the user to have half the fire (the central half) on, or the whole fire on, just as the prevailing temperature dictates. Now an important point about this is that no user of any of the existing types of this series of fires need be without the convenience of the new duplex tap, because it is quite an easy matter to *in situ* depose the old burner and tap and insert the duplex tap and burner. The same applies to any of these fires that may be in stock. It will also be seen that from now onwards any new fires ordered with duplex burners can be converted into fires with a single burner without any new part being needed other than the burner and the necessary brass fitting. These are the only parts required in either case; and, in conversion from the single to the duplex burner, all that has to be done is for the brass duplex tap fitting (in one piece) to be placed in the old screw holes, and the double burner slid into the place formerly occupied by the single burner. In this new duplex fitting, a single tap controls the two burners. Previously two taps have been used for the purpose; and obviously this made a most unsightly fitting. The new tap is anything but unsightly; and it is not complicated. By it, the movements are successive in obtaining the gas half on or full on; and the gas and air adjustments are combined in the one fitting. It is a distinct advance.

Then another improvement conducive to greater radiating efficiency, and to a lessened loss of heat at the back of the fires, has been applied. This is easily explained. The porous slip brick ordinarily used at the back of the fuel has been remodelled with a cavity at the back, so that it forms a non-conducting air-pocket between it and the brick back of the casing of the fire. Such a cavity was not specially provided in the original form of brick; and its ability, by the provision of the air pad, to prevent the rear escape of heat, is noteworthy. And talking of efficiency, the firm have attained to a high point in this regard. Recent independent tests (particulars of which the firm are willing to submit) show that the "A," "B," "C" series of fires has attained a radiation efficiency of nearly 50 per cent.; and the actual percentage of waste—the heat not actually utilized other than for creating a chimney draught—has been reduced to a remarkable degree.

Having now described the extension of, and the improvements in, the "A," "B," "C" series of gas-fires, there are a few other points to be dealt with. The Richmond Company have felt the demand for a higher class finished fire than the art-black finish which has long prevailed for ordinary use; and for this reason: Some three or four years ago, they introduced the porcellanite colour enamel process, which has been popular for decorative effect, and for harmonizing with the general appointments of any room. But there is a large vogue now for oak panelling and oak parquet flooring in high-class dwelling-houses (in certain rooms) and in others for copper fittings—such as fire curbs, pendants, and so forth. In rooms of this consistency in character, a gas-fire finished in coloured enamel would not be appropriate, and one

Richmond's "A," "B," "C" Gas-Fires in Solid Hand-Wrought Copper and Brass.

finished black would be out of harmony with the surroundings. To meet the requirements produced by such circumstances, the firm have introduced fires completely sheathed in copper, relief stamped or *repoussé* work; and a handsome Adam designed dog grate which, with the other sheath hand-wrought copper and brass fires, can be supplied in any design to suit the periods in which rooms of the present day are furnished. The illustrations are only intended as examples to give a general idea. Further, to meet the request for a fire of less cost than the copper sheathed types, a new finish has now been introduced in the "A," "B," "C" series—called the "A.B.C." finishes, signifying "art, bronze, copper."

These finishes are generous in the handsome character that is thus imparted to the fires; and while being a considerable advance on the art-black fires for the purposes referred to, the life is quite equal to the black finish. But should it be required at any time to renew the finish, it is easily and economically accomplished. The extra cost of these finishes is so small that we feel sure they will be of considerable use in the endeavour to combine with the utility of the gas-fire consistency of external appearance with environment. These fires, copper sheathed and with the "A.B.C." finish, are quite a new departure; and we illustrate some of the types to show how, apart from efficiency, the art of the gas-fire maker is being exercised in keeping pace with modern ideas in the matter of general furnishing and decoration. There is an excellence about the designs and general appearance that cannot fail to appeal to all who take an interest in the "home beautiful," and in artistic appointments.

From among much else that is new in design, a high-grade fire suitable for tiled recesses, and to replace the coal dog grate, arrests attention. Of coal dog grates there are so many in use at the present time, that they offer a good field on which to make a special raid. Two types of these gas dog grates are seen; and what is of importance, we learn that the decorative design can be in character with the periods of design extant in the particular rooms for the heating of which they are required. The design may be Adam, Georgian, or anything else; the framework of the fires being so prepared that it is quite a simple matter to work-in different ornament and suggestion.

One other point. The Richmond Company again draw attention to the fact that their fires can be fitted with the boiling-burners at the sides instead of on top, as is commonly the case. The small extra cost is well worth consideration by gas-supply authorities, as there is no doubt that an unostentatious boiling-ring at the side of a gas-fire is a convenience to the consumer, it allows of a fire that is suitable, in regard to shape and design, for the position in which it is intended to be fixed, and (what the gas supplier will not fail to fully appreciate) it means extra gas consumption.

Leaving interior gas heating, there is a field for the consumption of gas in out-buildings. For such purposes, the "Daisy" heater appeals favourably. This has a cast-iron boiler fitted with studded interior base, heated by a single oblong burner, which swings out for lighting, &c. The heater is particularly suitable for warming garages, either by hot-water pipes or connected to a radiator. An open flue end disposes satisfactorily of down-draughts.

It will be seen that there is ample reason for congratulating the firm upon keeping in line with scientific knowledge in the matter of gas heating, and upon keeping an eye on general tendencies in furnishing and house design, so that their goods shall have compatibility with current ideas.

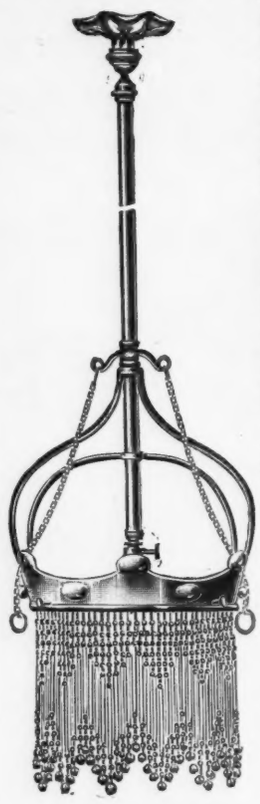
The second annual general meeting of the Institution of Municipal Engineers will be held at Eastbourne on Friday and Saturday, the 7th and 8th prox. The programme is one which should prove of interest to the members. The first day will complete the business proceedings; Saturday being devoted to a visit to the Newhaven works of the Sussex Portland Cement Company, Limited, the Directors of which will afterwards entertain the party at lunch.

The Gas Engineering Classes at the Manchester School of Technology will open on the 26th inst. Mr. C. E. Teasdale, of Salford, is again lecturer for the engineering portion. Mr. F. S. Sinnatt and Mr. W. Buckley are the lecturers in the chemistry section of the syllabus, in honours and ordinary respectively. Mr. Garlick is the lecturer in gas supply. This school claims to be the most successful in the country in the City and Guilds Examinations—obtaining last year two medals in "Gas Engineering" and one medal in "Gas Supply."

About thirty members of the Association of Yorkshire Students of the Institution of Civil Engineers paid a visit recently to the water undertaking which is being carried out in the Derwent Valley, some 12 miles from Sheffield. Ultimately in the two valleys of the Derwent and Ashop there will be a chain of five large reservoirs; but at the present time two of the dams only are in process of construction. The scheme is promoted jointly by Sheffield, Nottingham, Leicester, and Derby; and the work is being carried out under the control of a Joint Board. Originally it was estimated that £7,000,000 would be expended before the whole of the reservoirs were completed; but as some unexpected engineering difficulties had to be surmounted in the earlier stages of the work, it is considered probable that the total cost will be greater than this.

SOME GAS LAMPS AND FITTINGS.

THE evidence already gathered of extensive preparations for the coming season's trade by the suppliers of gas lamps and fittings, is added to by a visit paid to the Farringdon Road show-rooms of Messrs. J. & W. B. Smith. Nowadays the gas consumer is well catered for in all departments; and in the lighting branch, there are endless varieties to choose from—in the way of lights and of accessories. In the cheaper as well as the more expensive types, attractiveness is everywhere a feature. With the inverted burner, it seems, all things are possible, alike in the matter of appearance, as in that of lighting effect.



Fitting with Beaded Shade.

There are in Messrs. Smith's show-rooms many hundreds of patterns of fittings on view—pendants, brackets, &c., in all shapes and sizes—and it is difficult to single out from them special ones for notice. Suffice it, therefore, to say that the stock is wide enough in range to accommodate any taste, and that a special feature is made of goods that are well within the means of the vast majority (if not all) of the people who employ gas. Glancing round, a thing that strikes one is the number of beaded shades that are shown attached to inverted fittings. These are made by Messrs. Smith on the premises; and it is unnecessary to remark that there is no end to the combinations of colours that can be obtained in this way. They are in both large and small sizes, as required for attachment to pendants or brackets; and they are most pleasing in appearance, both when the gas is lighted and when it is not. That is to say, the beaded fringe is an ornament by itself; and one is not surprised to learn that it is "going well." Seeking information as to new points for the lighting season, we were informed that Messrs. Smith are supplying a new mantle—the "Glasmi Extra," an upright type which is made specially for street lighting, &c. It is a first-class three-ply mantle, made of carefully selected ramie silk thread, heavily impregnated with lighting fluid, and specially seasoned, so as to render it exceptionally strong and brilliant.

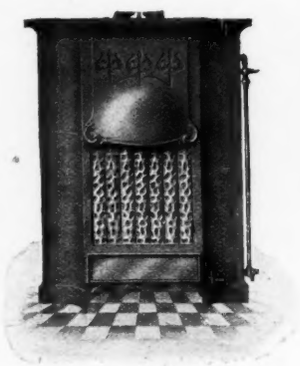
The new pattern "Shell" inverted burner the firm supply is a British made article, fitted with china shell heat deflector, gas-adjuster, air-regulator, and a magnesia mantle nozzle. It is nicely finished in polished brass, steel bronzed, or copper bronzed. Anti-vibrating pendants are shown, in which the weight of the fitting is entirely carried by a spring near the top end—no undue stress being laid on the inner tube. This dispenses with a ball-joint, while allowing the burner end of the fitting to be hooked up to the ceiling, when it is desired to get it out of the way. Coming to outdoor lighting, we hear the "Silva" lamp is still in good demand. For this a lighting efficiency is claimed of 125-candle power per burner for a consumption of about 4 cubic feet per hour. The air and gas adjusters are fitted outside the casing; and by simply removing the gas-adjuster, any foreign substance that may have found its way into the injector can be removed without disturbing any other part of the lamp. It is a substantial, British made lamp; and it can be supplied in one to four light sizes, with steel or copper casing and ordinary or parabolic reflector.

One-Light Improved "Silva" Lamp.

SIMPLICITY IN GAS-FIRES.

SINCE the introduction of electricity, both for lighting and heating, it is significant that gas companies and corporations have realized their opportunities more strongly than ever before, and are now beginning to assert themselves in many directions. In no sphere of the gas industry has this been more exemplified than in domestic gas heating; and year by year the number of heating appliances manufactured and sold to the consumer has steadily increased. In this respect, the past twelve months have been no exception; and it is an undoubted fact that a larger number were disposed of than ever before.

There are, no doubt, many reasons that may be assigned as the cause of the ever-increasing popularity of gas-fires; but among them are to be reckoned the following: Appliances have become cheaper for gas companies and corporations to purchase; fewer loose parts are now employed, and consequently maintenance has been reduced to a minimum; while from the design and efficiency point of view, considerable advance has been attained. In considering the first point, there is no doubt that fires as made at the present day can be manufactured and sold at prices which are only a fraction of those which obtained with the old-pattern deep fire, which, as a rule, when once fitted together, could hardly be taken down, nor even the burners removed for cleaning purposes in a consumer's sitting-room. To-day it is different; for, with the simplified designs and the irreducible number of loose parts, the capital cost and the maintenance expenses have been reduced to their lowest level—thus enabling gas companies and corporations to seek and to obtain an ever-extending demand. Naturally the consumer reaps the ultimate benefit from the reduced capital expenditure necessary, and also by the continuous reductions in the price of gas announced so regularly, and now rendered possible by improved methods of manufacture. Again, from the consumers' point of view, the reduction in the quantity of gas necessary to keep a modern fire as a reasonably efficient

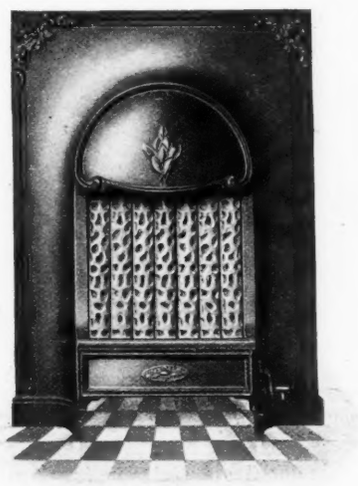


The D.S.O "Original" Fire.

The D.S.O. "Dependable" Fire.

The D.S.O. "Symmetrical" Fire.

heating unit, and also to keep the appearance of the fire sufficiently attractive, enables them to make more use of the apparatus placed at their disposal. As to efficiency, this is a subject in which ever-increasing interest is being taken; and it is submitted by the firm of manufacturers mentioned below that it is a moot point whether fires as designed and made under present-day conditions, with equally satisfactory burners and means of regulating gas and air, are any more efficient in the shallow style with the long single column of fuel than in the deep style with ball fuel or than the still older type of fire with iron frets. Undoubtedly, the present type of gas-fire is used not so much on account of its efficiency as because of the need for cheapening the cost and improving the appearance. The amount of heat radiated is only



A "D.S.O." Fire, with Brass Ornaments.

one of the many points which have to be watched; and there is no doubt that, when the subject ceases to be treated only superficially, it will be realized that the only useful measurement of the heat from a gas-fire is its capacity for raising the heat of a given sized room in a reasonable time. It is the total heat obtained that has to be taken into consideration, "as most, if not all, of the radiated heat can only do useful work when the energy emitted acts by convection."

So say Messrs. R. & A. Main, Limited, the pioneers of the shallow fire, introduced by them over ten years ago in their "Melrose" and "Canterbury" series. They had the question of cost and design in mind when putting these on the market; and successful as they have been, it becomes increasingly evident that their judgment was correct. They have now been experimenting for over three years, and claim to have arrived at a stage when they feel justified in putting forward their new series of "D.S.O." gas-fires. Of the many original features embodied, the construction of the fire itself is unique. There are only two castings; the fire being in one casting, with the addition of a flue-chamber at the back. The burner is detachable, and is fitted with both gas and air regulators; while the adjustment of neither can be moved accidentally. Another novel feature in this series will be found in the construction of the fire-brick back. This is in two pieces; the top half keeping the lower half of the brick in position, and being itself kept in by the canopy of the fire.

The front brick is made so that it will fall slightly by its own weight, and in it is formed a chamber for the flue gases, in order that any useful heat remaining after the flame has passed up the fuel may be utilized; while the slot which is cut in the lower side of the brick is so formed as to engage the top end of the fuel and lock it in position. By this means, the necessity for fire-bars is done away with. This is a new feature which has been the subject of exhaustive experiments; and though the fires might have been marketed last year, Messrs. Main preferred to make quite certain of their ground. The only loose parts in these fires—viz., the fuel, the burner, and the bricks—are all removable without having to undo any screw or fastening whatever. The fuel is laid with a slight slope backwards, so that the maximum amount of heat is obtained, which is radiated at a slight angle from the horizontal. In addition, the fuel is locked top and bottom, and, being tapered on the front, should it accidentally get broken, it cannot fall out of the fire. With Messrs. Main's new fuel [provisional patent No. 11,357 of 1910], the back of the fuel is so constructed that, for all effective purposes, it takes the place of the brick. It can therefore be made heavier, and consequently much stronger. In addition, tits or projections are formed on the back, so as to obstruct the otherwise free passage of flame. By this means, the maximum heat is extracted by the fuel. The fires are made in two sizes and in three styles; and Messrs. Main are making various ornaments for corners, canopy, and fender on a scale which, they claim, has never before been attempted.

In addition to this entirely new type of fire, Messrs. Main are still continuing to supply their "Gainsborough" and "Dundee" fires, both of which are too well known to need further comment, as well as the "St. Nicholas," which is a very satisfactory way of turning a coal-fire into a gas-fire. By the way, the firm are also making a special feature of the patent regulating valve to their radiators.

The London and Southern District Junior Gas Association have forwarded a copy of their "Transactions" for the 1909-10 session, which have been reprinted from the "JOURNAL" reports of the proceedings. As a frontispiece there is a portrait of Mr. W. J. Liberty, who was President during the period covered by the volume. It says much for the energy with which the affairs of the Association are carried on, that the matter and illustrations cover about 130 pages.

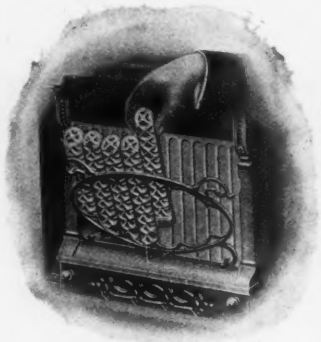
PARKINSON STOVE COMPANY'S NEW PATTERNS.

At the High Holborn show-rooms of the Parkinson Stove Company there are now to be seen the new goods which the firm are introducing for the coming heating season; and inspection shows that there are various improvements worthy of note.

Much time and thought have been devoted to the question of fuel; for though it had been found that the "Intense" pillar fuel which was introduced last season gave highly satisfactory results, this did not deter the Company from continuing experiments with a view to the securing of still further improvement. The upshot has been a slight strengthening of the fuel, to overcome any tendency to fragility; and a more important improvement in the shape of the head of the pillar. The tops are now bevelled off, with the idea of giving a finish to the heating surface, while at the same time securing a completely incandescent pillar with a minimum gas consumption. Hitherto the fuel has been made with a lot of rough projections inside; but the conclusion has now been arrived at that these are just as well done without. A freer passage is thus provided for the gas. The new fires, it will be noticed, are still provided with the oval guard, which, while neat and artistic in design, accomplishes its purpose with the very smallest amount of obstruction to the radiant heat. One of the illustrations indicates, however, that a step in advance has been made by the pivoting of the base of the guard. This renders the removal and replacement of the fuel a matter of the utmost simplicity. The grip is disengaged by a slight upward movement, which allows the guard to fall sufficiently forward for getting at the fuel. Just as easily is the front restored to its proper position, in which it holds the fuel firmly until the necessity arises for again releasing it. The improved gas and air adjuster, allowing of a separate adjustment of both gas and air while the stove is burning, has this season been retained, and is fitted on all the firm's fires. Another matter that may here be mentioned is a patent safety-tap for use on fires, which has been designed for the purpose of preventing accidental turning during domestic operations—sweeping, dusting, &c. The tap is provided with an ordinary plug, having a loose key fitting on a shank with a spring attached. Before it can be turned, this key has to be lifted up so that the pin fixed to it comes out of a groove; and thus the movement can only be a deliberate one. A tap on the same principle is also available for cookers. A side-boiling burner is added when required to any round type fire.

Improved "Intense" Pillar Fuel.

Safety Gas-Fire Tap.



Pivoted Oval Fire-Front.

Boiling-Burner Attachment.

Now a word as to the patterns of the fires themselves. The "Agate," the "Basil," and the "Crystal" fires, which are illustrated, exhibit a great variety of design that should meet most requirements; and they are, in different sizes, finished in art black enamel, porcelain enamel, or armour bright. The "Agate" pattern was introduced last season, but only in the 15-inch size.

The "Agate" Fire.

The "Basil" Fire.

The "Crystal" Fire.

As, however, there was discovered to be a demand for smaller sizes of this type (the bold artistic design and simplicity of which had found much favour), two additional sizes have now been added—namely, 10-inch and 8½-inch. Uniform with this is the "Basil"—an entirely new round-top fire, which is made in 8½-inch and 10-inch sizes. The "Crystal" is an attractive fire of the nursery type, fitted with a boiling-burner and cap on top. Here, again, combined with a pleasing outline is the utmost simplicity as far as ornament is concerned. The "Onyx" 13-inch fire, which was so successful last year, has been retained without alteration, for those who are on the look out for a fairly large heating surface. The wearing parts of all these fires are absolutely interchangeable, size for size, which is a decided convenience in connection with the stocking of replacements; and any fire, from 10-inch upwards, may be fitted with a duplex burner, if desired. The new "Panel" fire is a useful addition to the inset type. It is made in two sizes, fitted with a duplex burner, and affords an exceptionally wide heating surface of "Intense" pillar fuel.

In another branch of heating, the "Comet" luminous-flame radiator is a new pattern of neat design and substantial make. It is arranged on the sectional principle, each column having its own burner controlled by a separate tap. In cookers and hot-plates, too, the Company are showing a wide range, which includes some types that are not familiar to the gas consumers of this country. These are made by the firm on the Continental pattern, and are intended for the foreign market—a branch of the business which the Parkinson Stove Company have lately been developing considerably.

Scottish Junior Gas Association (Western District).

We are informed by the Hon. Secretary and Treasurer of the Western District of the Scottish Junior Gas Association (Mr. David Fulton) that the syllabus for the seventh session, 1910-11, is now complete, and is as follows: Oct. 8, Presidential Address of Mr. John Fraser, of Provan. Oct. 22, visit to the Atlas Locomotive Works at Springburn. Nov. 5, paper on the "Repair of Meters," by Mr. George Scott, of Glasgow. Nov. 19, visit to the Cadzow Colliery. Dec. 3, paper on the "Calorimetry of Gas," by Mr. George Braidwood, of Dawsholm. Dec. 17, annual social gathering. Jan. 14, 1911, paper on "Gasholder Construction," by Mr. J. Taylor, of Glasgow. Jan. 28, visit to Messrs. R. Laidlaw and Son's Edinburgh Meter-Works. Feb. 11, paper on "Retort-Settings," by Mr. J. Murray, of Glasgow. Feb. 25, joint visit with the Eastern District of the Association to the Airdrie Gas-Works. March 11, annual general meeting, and paper on "Coal: Its Formation and Variations," by Mr. John Gillespie, of Glasgow.

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INVERTED—

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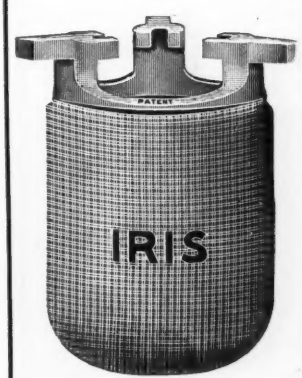
Gives a truly brilliant light.
Universal Ring to fit any Burner.

"IRIS" Brand Inverted.



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MANCHESTER JUNIOR GAS ASSOCIATION.

Visit to Messrs. J. & J. Braddock's Works at Oldham—Details of the University Scheme.

Over sixty members of the Manchester and District Junior Gas Association took advantage of the opportunity afforded them of visiting the works of Messrs. J. & J. Braddock (Branch of Meters Limited) at Oldham last Saturday afternoon. On arrival, the party were welcomed by Mr. G. H. Braddock, Managing-Director of the firm, Mr. R. E. Braddock, his brother, Mr. J. Hawkyard, the Works Manager, and Mr. J. Berry, Assistant Works' Manager. These gentlemen, along with Messrs. J. Taylor, R. Fowler, W. T. Glover, J. A. Maylor, A. Todd, and H. Fletcher, acted as guides through the different departments. Added interest was given to the inspection by reason of the fact that the 400 employees of the firm were at work, owing to pressure of orders.

For a start a visit was paid to the foundry, where was seen in operation the casting and moulding of the various brass parts required in the construction of the meters. Passing on to the stamping-room, interest was taken in the process of stamping from the tin plates; and in the adjoining department for brass finishing, the latest types of automatic tools were seen in use. In the station-meter erecting shop, the visitors were shown, and had described to them, the various station-meters in course of construction—one being for 60,000 cubic feet per hour. There were also on exhibit station-governors, one of which was seen in action; and likewise retort-house governors. From these works, a station-meter designed for 250,000 cubic feet per hour has been recently turned out. A good deal of time was spent in the test-room, and other departments came in for much attention; the afternoon being well advanced before the inspection was finished.

RETORT-HOUSE GOVERNORS.

Before the party left the works, the following paper was read by Mr. J. BERRY, on "Retort-House Governors."

So far as can be ascertained, it is perhaps about forty years since governors were first used in this country to control gas in the hydraulic mains; and they are stated to have been installed in the gas-works at Preston, Stalybridge, and, later, at Salford and elsewhere. It would not appear, however, that they met with any great degree of success, judging by their limited adoption; for it was not till about nine years ago (when Mr. Charles Carpenter, of the South Metropolitan Gas Company, installed them in his works) that retort-house governors again came into prominence. The innovation at that time was, like all revivals, looked upon with a certain amount of scepticism. Many were the arguments used for and against their adoption; but I think you will agree with me when I say that at the present time most of the prejudices have been broken down, and there are comparatively few works of any importance now in the country that have not installed one or more of these governors, with beneficial results.

The first question to ask oneself, before advocating the use of retort-house governors, would be: What are the advantages to be obtained from them? These I should sum up as follows: (1) That the most desirable conditions could be maintained in the hydraulic mains. (2) That the candle power of the gas would be steadied. (3) That the maximum yield of gas per ton of coal carbonized would be realized. Why do these results accrue from the adoption of a retort-house governor? Because the governor, by reason of its sensitiveness, creates a condition of steadiness in the foul main, and consequently the liquor in the hydraulic main will not be subjected to the same violent oscillations—thus allowing the distillation of coal to be carried on under less varying conditions of pressure and vacuum.

In selecting a retort-house governor, special attention should be paid to the following important points:

(1) The governor should be simple in design, and have no complicated parts or delicate adjustments.
(2) The governor should be so constructed that all deposits of tar which may accumulate in the tank will be reduced to a minimum; so that the periods between cleaning will be as long as possible.
(3) The flow of gas through the governor should be as free as possible. Hence the governor should have no more deviations in the gas-ways than absolutely necessary.
(4) Ample provision should be made for cleaning whenever this is required.

I will now endeavour to explain, as briefly as possible, how the Braddock enclosed retort-house governor fulfils the conditions set forth.

The valve box is of special design, and in it a very important improvement has recently been made, which we claim has placed the governor in the front rank for efficiency. In our latest design of valve box, the flow of gas has only one deviation; but in our older pattern the gas made three deviations. Hence the great advantage of our latest improvement over our earlier patterns and many other makes. It must be admitted that, having only one deviation from a straight flow, the travel of the gas will not be as much restricted, owing to frictional resistances being reduced to a minimum; and therefore condensation at this point becomes practically *nil*.

The valve has also received special attention, and possesses certain advantages. Our valve is an open-ended cylinder with parabolical slots cast in the lower half. By means of the parabolical slots (instead of parallel or conical slots) the travel of the valve is reduced by one-half, and therefore the governor responds more promptly to any increase or decrease in volume that occurs. This is noticeable in charts obtained from Braddock retort-house governors, which have shown the charging of every retort; and where a recorder is used together with the governor, it gives a check upon the time of charging the retorts.

The governor tank and bell are so designed that tar deposits are not likely to be troublesome. A centre sealing tube seals an upright pipe through which passes the valve rod; and the condensation in this small tube (only a few inches in diameter) is practically *nil*. The retort-house governors have worked from six to twelve months or more without attention in the way of cleaning; but, of course, much depends on local circumstances.

The method of controlling or actuating the governor is by means of a tube or pipe coupled to the inlet side of the governor upon the foul main, and any increase or decrease in pressure or vacuum in the foul main is communicated through this tube to the bell, causing it to rise or fall and open or close the valve. The Braddock governors first introduced this method of control.

With respect to cleaning, the governors are fitted with large sheet-iron plates on each side of the valve-box; so that the valve is at all times easy of access.

The Braddock retort-house governors are made in both float and counterbalance type, and are exactly alike in the principal external dimensions. With the counterbalance type, all repairs are reduced to a minimum, as there is no float, and a greater range of "pull" or "vacuum" may be obtained by means of the weights. The beam pin and seatings used are entirely enclosed, so that they require the minimum of attention and cleaning. In working, we find the action of a retort-house governor to be the exact opposite of a station governor, for it controls the inlet and not the outlet as in a station governor; also the valve is opened by any increase in pressure, and not closed as is the case in a station governor. With regard to fixing and working the governor, I think most engineers are agreed that the ideal position is on the foul main at the end of the retort-benches, and to work with as light a seal as possible—say, ¼-inch—and to set the governor to 2-10ths pull or vacuum. But, of course, this question must be settled according to existing conditions of the hydraulic main; and as these vary considerably, no hard-and-fast rule can be laid down upon the point.

Turning, now, to the attention required by a retort-house governor, I am afraid that, owing to its somewhat isolated and not easily accessible position, it is apt to be deprived of that little attention which is necessary for its efficient working. Many engineers now put oil in the governor tank to a depth of about 2 or 3 inches, causing the bell (during its travel) to work through oil, which preserves the bell and considerably lengthens its life. The bell itself should be cleaned and painted with a good paint or rust preventative about every six months; and the water-level in the governor tank should be maintained by constant drip, or attended to at least twice a week. When we consider that this is all the attention necessary, I think we cannot but agree that it is very little that is asked, and certainly ought not to be neglected when we sum up the beneficial effects which are brought about.

A cordial vote of thanks was accorded to Mr. Berry for his paper, on the motion of the President. Subsequently members adjourned to the Union Club, where "High Tea" had been provided for them by the Directors of the firm. Mr. F. Thorp, the President, was in the chair, and was supported by Messrs. G. H. & R. E. Braddock. There was a little speech-making after the menu had been got through.

The PRESIDENT said that, when the suggestion was made for a a visit to the works of Messrs. J. & J. Braddock, it was hailed as an admirable one. The visit had been extremely interesting; and the pleasure had been added to by the generous treatment they had received at the hands of the firm. The name of Braddock was known the world over; and they had a reputation for good workmanship which was not by any means local. The inspection of the works had given the members a better idea of how this reputation had been gained.

Mr. J. H. MASSEY (Oldham) moved a hearty vote of thanks to the Directors for giving the Association an opportunity of inspecting the works, and also for their hospitality. With the vote he coupled the name of Mr. A. Manning, of Meters Limited, and the gentlemen who had shown the party round the works—adding that the interest of the inspection had been enhanced by the fact that they had seen the men at work.

Mr. J. BRIDGE (Stretford), in seconding, observed that the Association had been highly favoured by the invitation extended by Messrs. Braddock to be shown how meters, large and small, were constructed. In passing from room to room in the works, the members had seen many things which would be of advantage to them in their work.

The motion having been carried with applause,

Mr. G. H. BRADDOCK responded. He said they had only been too pleased to show the members over the works; and he hoped that what they had seen had been of interest and of benefit to them. Generally, they found that people visiting the works were interested with what they were shown, mainly because of the great variety of work carried on by Meters Limited. It was ever

the aim of his firm to turn out a really first-class article; and the visit had no doubt impressed the members with the great care which was exercised in the manufacture of gas-meters. He pointed out that, as a rule, meters tended to register on the slow side; and it meant a great deal to a gas department if the utmost care was not taken in their construction. A gas-meter could not be too well made, especially seeing that it was the practice to put them in cellars and out-of-way places, and expect them to have as good a life as if housed in a better place. They at the Globe Meter Works were proud of their management, and of their staff, who rendered excellent service; and all of them were pleased to meet the members of the Association.

Mr. R. E. Braddock also spoke in response to the vote, as did Mr. Berry and Mr. Taylor.

THE GENERAL MEETING.

A general meeting of members was held subsequently—Mr. F. Thorp in the chair. The chief business had relation to the University Scheme, which had its origin in a suggestion made at the annual meeting by the President in the course of an address he delivered upon taking the chair. Since then, a small Sub-Committee has been at work; and the Council now submitted details of the scheme for the approval of the members.

The President, having explained that it had been found impossible to complete the scheme for submission to the members before, in consequence of the many details which had to be dealt with, said that everything was now in order, and the Council took the present opportunity of letting the members know what had been arrived at. It was his hope that what had been done would meet with the unanimous approval of the members, so that a step forward would be made towards placing their profession on a higher level, and enabling it to take its stand among the other professions. For some reason or other, the gas engineering profession had not been looked up to as it ought to be from the importance of the work done; and the Manchester and District Junior Gas Association considered that, in arranging for a closer connection between the University and themselves, they had taken a step in the right direction for obtaining proper recognition of the profession. In his opinion, the "bill of fare" submitted was an excellent one. From the particulars supplied, it would be seen that it was proposed that two courses should be given during the next session. There would be a course of six lectures on the science of gas manufacture and combustion. Up to the present time, the following lectures had been provisionally arranged for: "Combustion of Gases," by Professor Harold B. Dixon, F.R.S. "Internal Combustion Engines," by Mr. Dugald Clerk, M.Inst.C.E. "Carbonizing," by Dr. H. G. Colman. "Construction as applied to Gas-Works," by Mr. Charles Hunt. "Chemical Control of Gas-Works," by Mr. J. T. Sheard. "Photometry or Pyrometry," by Dr. J. A. Harker, F.R.S. The lectures would be given in the Chemistry Theatre of the Manchester Victoria University, commencing at 3 o'clock in the afternoon of the first Saturday in each month from October to March. Admission would be free to all those interested in the gas industry. The members of the Sub-Committee appointed by the Association were interested more particularly in the syllabus of Scheme II., which included a course of twelve lectures and demonstrations on the chemistry of gaseous fuel and flame, designed for those who have already acquired a knowledge of gas manufacture. The suggested syllabus was as follows: "Kinetic Theory of Gases." "Pressure of Condensable Vapours." "Nature of Chemical Change." "Flame and Its Structure." "Theory of Luminous and Non-Luminous Flame." "The Ignition-Points and Specific Heats of Gases." "Temperature of Flames." "Phenomena of Explosion in Gases." "Pyrometry." "Standardization of Thermo-Junction Pyrometers." "Constant Temperature Furnaces." "Calorimetry." "Preparation of Pure Gases." "Manipulation and Analysis of Gases." "Theory of Fractional Distillation and Condensation." These lectures would be given by Professors Dixon and Carpenter and Dr. Norman Smith, or other members of the staff; the suggested times being from 5 to 7 p.m. or 7 to 9 p.m. on Mondays. The fee for the whole course was £1 1s. Each subject would be treated from a gas engineer's point of view; and it was hoped that those attending this course might afterwards undertake some research work in connection with gas problems. The University lectures would supply the need of the general body of members, while the evening classes would meet the requirements of special students, without in any way interfering with the work done by the technical classes, or with the Leeds University course. The Sub-Committee felt sure Scheme II. would not be considered too academic—especially seeing, as he had indicated before, that the lecturers would so prepare the lectures and demonstrations that the direct bearing upon the gas industry would be seen. In this, the lecturers would be assisted by students preparing a list of the practical problems to be elucidated. He desired to express his thanks—and those of the Sub-Committee—to Professor Dixon, for the assistance he had given in these matters, and for the way he had met them in the drafting of the scheme. They had also to acknowledge the aid given by the Senior Association; and he ought to add that their scheme had the approval and good wishes of the Council of the Institution of Gas Engineers. With regard to the financial question, matters had been so arranged that there would be no need to touch the funds of the Association. They had therefore everything to gain, and nothing to lose; and he ventured to hope that the scheme as now outlined would meet with approval, and that the lectures and classes would be an unqualified success.

Mr. A. L. Holton moved the adoption of a resolution endorsing the action of the Sub-Committee and the Council in regard to the University scheme. In the course of his remarks, he said that it was his pleasure at the annual meeting of the Association to move the appointment of the Sub-Committee to consider this University scheme—expressing the hope that they would do their work thoroughly. He now had to move the confirmation of what they had done. He did not anticipate, when he proposed the resolution at the annual meeting, that the Sub-Committee would have gone into the matter so thoroughly as they had done; and it was his hope that other Associations would make a move in the same direction. In his opinion, the syllabus arranged touched high-water mark; and he trusted members of the Association would take full advantage of the facilities offered by it.

Mr. J. M. M'Nicol (Warrington) seconded the resolution. The Sub-Committee, he said, were to be congratulated by the members of the Association on the excellent way they had gone through with the scheme propounded at the annual meeting. It only now remained for the members to back-up the Council and attend the meetings in larger numbers.

The resolution was carried unanimously.

Mr. Holton then moved that the thanks of the Association be tendered to the following gentlemen for their assistance given in formulating the scheme: Professor H. B. Dixon, of the Manchester Victoria University; Messrs. H. Kendrick, T. Duxbury, and S. Meunier, of the Manchester District Institution of Gas Engineers; the members of the Sub-Committee of the Junior Association, Messrs. Thorp, Hollingworth, and Alsop, together with Mr. J. Taylor (Mossley); and the Council of the Institution of Gas Engineers.

Mr. C. E. Woodhead (Manchester) seconded. He said that the Sub-Committee had done their work well. Undoubtedly, they had been fortunate in having the assistance of Professor Dixon and the support of the Institution of Gas Engineers and the Manchester District Institution in this matter.

The resolution was carried.

Mr. J. Alsop (Hon. Secretary) then gave an outline of the Association's syllabus for the ensuing session. After the lecture at the University on Nov. 5, there is to be a whist-drive. On Dec. 17, the members go to Southport, on a visit to the gas-works there. The annual meeting takes place on April 1. The third Saturday in May is marked off for a joint meeting in Birmingham of the Junior Associations; and on June 3 a visit will be paid to the Blackpool Gas-Works. Mr. Alsop added that it was intended to hold a meeting of their own after each lecture at the University, when they could discuss among themselves the points which had been dealt with by the lecturer for the day. In this way, they could clear up any matters not understood at the lecture.

PRACTICAL ILLUMINATION.

At the Congress of the Royal Sanitary Institute held last week at Brighton, Mr. John Darch read a paper on "The Eye as It Affects Practical Illumination."

The author said the conditions—at once those of daylight, and those essential to good artificial illumination—are: (*a*) A sufficiency of light; (*b*), perfect steadiness; (*c*), effective diffusion and freedom from violent contrasts; (*d*), a downward direction and preferably oblique; (*e*), the colour to be as white as possible. However readily these conditions might commend themselves, it was not too much to say that they were violated in nearly every lighting installation in the kingdom—whether of gas, electricity, or what not. That nature's conditions of lighting were the best was shown by the fact that myopia is unknown in savage life, and extremely rare among seamen and farmers, more particularly in the case of those whose childhood was spent in the open. Defective vision is the outcome of an ill-regulated civilization; and it was estimated that about half the studious and close working classes were sufferers therefrom in one way or another. Insufficient lighting in schools, offices, and workshops was largely responsible for the increase of myopia, astigmatism and many attendant nerve troubles; but, so far as artificial lighting was concerned, the ever-increasing brilliancy and cheapening of light, properly applied, made the remedy easy. For reading and ordinary work, there should be an illumination of 0·8 to 1·5 foot-candles; for drawing and fine work, 3 to 10 foot-candles.

High brilliancy in lighting did not, in itself, deserve the hard words which some had applied to it. Like all other forms of energy, light was a good servant but a bad master; it was a source of health and pleasure, and the more they had of it under control the greater the possibilities of good results. But glare from ill-placed and ill-tempered lighting was responsible for much suffering. The dazzling effect of a source of light might be due to (1) its intensity, (2) its composition, (3) its contrasts. A question still open for settlement was the maximum intrinsic brilliancy from any point or surface (and it was the intrinsic brightness and not the total flux of light that counted physiologically) that might be continuously and safely gazed upon. Dr. Louis Bell gives

5-candle power, and Dr. Stockhausen 4-candle power per square inch as the maximum permissible brightness from a hygienic point of view; but Woodwell (U.S.A.) gives 0·2 to 0·1. The author was still of opinion that 0·05-candle power per square inch was the maximum intrinsic brightness that one might gaze on continuously. For short periods, however, 0·1 might be comfortable. All lights should be rigorously precluded from the field of vision, or, if translucent screens be used, these should not transmit more than 0·05-candle power per square inch.

Bad lighting was invariably due to the absence of suitable and sufficient reflecting surfaces. If the whole expanse of the sky was needed for the diffusion of sunlight, surely every inch of the ceilings and walls should be made to do similar duty and to yield at least 50 per cent. of its incident light. This would give the greatest amount of the most agreeable and serviceable of all light—diffused. The eye, alone, was incapable of judging actual intensity in lighting, and some reliable means of ascertaining such intensity was essential to the most elementary proceedings.

The need for legislation in respect of adequate lighting had long been felt. Something had been done in the Factory Act Regulations of 1908—requiring that certain rooms shall be "efficiently lighted." Such an expression was, however, indefinite and difficult to enforce, and, until the amount of light to be supplied could be stated in terms of standard units, such legal enactments offered little hope of success. This should present no difficulty, as we now had convenient and portable instruments, known as illuminometers, for measuring and indicating in foot-candles the amount of light falling on a desk, bench, or other surface. They were at present mostly in use by street-lighting engineers; but one should be in the hands of every factory and school inspector, and every architect desiring good natural and artificial lighting in his buildings.

There were many ways in which the rules he had laid down might be applied, the choice of which would be guided by taste and circumstances. In this short paper, he could but indicate certain useful arrangements—viz., let the engineer remember the simple axiom: "The purpose and object of artificial lighting is to make properly visible the things required to be seen." This really covered the whole case, but might be interpreted in the following rules: (1) The lamps or other sources of light should be so arranged that they are not visible from the more frequented or ordinary points of view. (2) The illumination should be sufficient to cause the objects to appeal at once to the eye, but should be free from glare. (3) For general illumination, the light should have a preponderating downward direction, freely flooding ceilings and walls, uniformly distributed, and fully diffused. (4) Special work at desks, benches, &c., should have special lighting, adjustable in position and power, with opaque shades. (5) The colour of the light should be as pure and white as possible. All monochromatic light should, as a rule, be avoided.

The stages of theatres were about the only places that were always well illuminated; the scenery and the lighting were each the complement of the other, with the most natural and agreeable results. Now, if architecture had any power to charm, that power could only take effect when it was subjected to suitable lighting. It was curious that this truism was so completely overlooked, as one might see in any public building, sacred or secular. The architects of Ancient Rome well knew that it was upon the lights and shadows that their superb art depended. With regard to the disputed question of direct *v.* indirect lighting, he advised them to always prefer direct lighting in so far as it would accord with the above rules; indirect lighting where specially suitable or inevitable; and for the rest, an arrangement of limited obscuration of lights which combined the advantages of the other two.

Street lighting was at present extremely unsatisfactory. There was no diffusion, no reflection, nothing but a blinding display of lights in a background of darkness, that, amid motor-cars and the like, only served to bewilder the bravest. Why should not these intense lights be shaded, the exteriors of the buildings as well as the pavements illuminated, and, by the encouragement of diffused light, the citizen be able to see what manner of place he was in, and to walk or drive comfortably and safely through it? It would have to come by and by.

Scottish Smokeless Coal Syndicate.

In view of the publicity which has been given to the use of smokeless fuel by the Coalite Company and to the various exhibitions which have been held throughout Britain—the latest, that now open in Glasgow—it is of interest to know that similar fuel is being manufactured and put on the market by the Glasgow Company named above. Why more has not been heard of the Company is due to the fact that they have been somewhat hampered, owing to opposition by the Coalite Company. The latter have, however, we are informed, failed in their proceedings, and the Glasgow Company are now prepared to grant licences, both at home and abroad, to parties wishing to manufacture such a product. There seems to be no doubt whatever that if the manufacture of this type of fuel were undertaken by a gas company or corporation, who could themselves find a ready sale for the smokeless fuel, and also for the various and valuable bye-products resulting therefrom, the fuel could be sold at remunerative prices; and if a sufficient and constant supply of it was constantly available, the community would not likely be slow to adopt it for general use.

DESSAU VERTICAL RETORTS AT MAGDEBURG.

The eight benches of Dessau vertical retorts (ten in a bench) put into operation at Magdeburg in the autumn of 1908 have been working uninterruptedly up till now, and will be kept working until next year, in order to be then put in proper condition again after two-and-a-half years' working. Their structural condition, it is reported, continues excellent, and is far superior to that of the horizontal benches after the like working time.

From the eight vertical benches (including some horizontal benches) at Magdeburg there were obtained, from 100 kilos. of coal, an average of 34·4 cubic metres of gas, as against 31·10 in 1907 when the vertical retorts had not yet been built. The saving amounted to 569 double truckloads of coal or (at 50 marks per load) 28,450 marks (£1422). In wages, there were spent: 1907, for oven working, 103,451·93 marks; for cleaning, 11,402·49 marks. In 1909, for oven working, 68,123·78 marks; for cleaning, 9725·25 marks. That is, there was a reduction for oven working of 35,328·15 marks, and for cleaning of 1677·24 marks—total, £1848. The yield of ammonia was: In 1907, pure ammonia, 0·17 per cent. of the coal; 1909, pure ammonia, 0·217 per cent. of the coal. The extra profit in pure ammonia is (23,340 kilos. at 1 mark) 23,340 marks (£1167). For naphthalene washing oil, there was expended 5296·48 marks, as against 13,158·44 marks the previous year—a saving of 7861·96 marks (£393).

The total saving from the year's work of the eight vertical benches is therefore 96,651 marks (£4832). No account has been taken of the partial use of Westphalian coal, with a smaller yield of gas, as compared with the best English coal, nor of the better quality of coke (which produces less breeze) and the lower cost of keeping the benches in condition. The vertical benches, therefore, it is claimed, perform what they promised; and "it may be expected that the working of the ovens at present being erected will give rise to further savings."

WATER-TOWER IN REINFORCED CONCRETE.

A conspicuous feature at the Brussels International Exhibition is an elevated reservoir situated near the electric power house.

Fig. 1.—Water Tower at Brussels. Height, 150 feet. Capacity of Tank, 180,000 gallons.

The tower rises to the height of 150 feet, and is surmounted by a circular reservoir having a capacity of 180,000 gallons. It is shown in the accompanying illustrations. Fig. 1 is a general view of the completed structure (which, in addition to the temporary purpose of supplying water to the exhibition, also forms part of the system serving the suburban district of Ixelles). Fig. 2 is a vertical section, showing the general character of the design and internal arrangement. Fig. 3 is a sectional plan of the foundations.

The base of the structure, providing accommodation for pumping machinery, valve chambers, and pipes, has the interior diameter of 47 ft. 6 in., and is built of brickwork faced above ground with granite blocks, and supported on a reinforced concrete foundation comprising two concentric ring beams with a

connecting slab by which the weight is distributed at the rate of about 2¼ tons per square foot. Two entrance doors at the ground-floor level give access to the pump-room and main staircase respectively; the latter communicating with suites of rooms on the first and second floors for workmen in charge of the machinery and apparatus. There are four other floors, all connected by a winding stairway, which is continued by a spiral staircase through

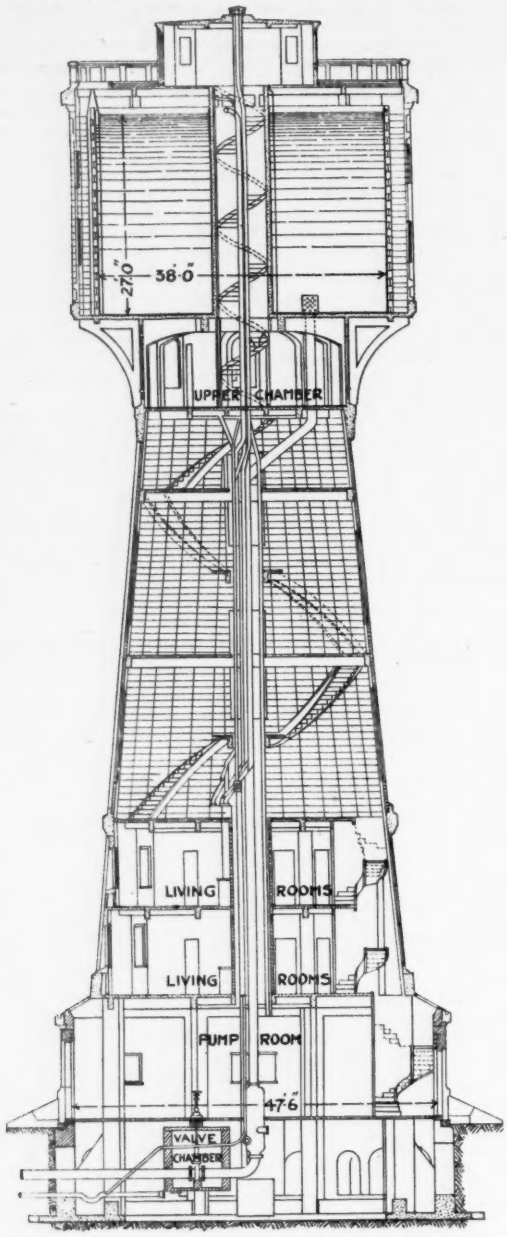


Fig. 2.

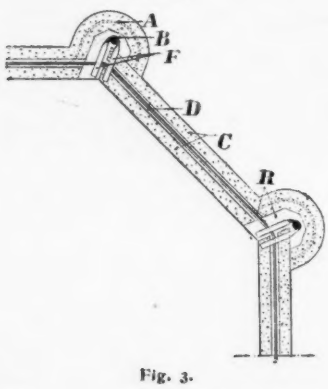


Fig. 3.

the centre of the reservoir, giving access to the flat roof. Three of these upper floors are merely landings, while the fourth floor forms a room immediately beneath the reservoir. The water supply and delivery pipes are carried up to the reservoir inside a cylindrical casing of reinforced concrete passing through the centre of the tower.

Having briefly indicated the main features of the tower, attention may be directed to the method of construction, for which it is particularly remarkable. Instead of being built in monolithic reinforced concrete as usual, the shaft and reservoir are formed of reinforced concrete blocks of special form applied in accordance with the system devised by M. Dumas, a Belgian architect and engineer. It has already been adopted on a fairly extensive scale for the construction of boiler chimneys; but the present example is the first application made in the form of a water-tower. It consists in the employment of blocks, as illustrated in fig. 3, for building up the successive courses; the blocks being jointed by reinforced concrete filling, and tied together by a horizontal rod laid and embedded in grooves, and connected at its ends so as to bind each course securely, and make it a unit capable of withstanding any required amount of outward pressure. Alternate courses are laid in reverse directions, with the object of increasing the bond, which is further aided by longitudinal steel bars in the projecting end of each block—these bars extending throughout the entire structure.

Referring to fig. 3, the reinforcement A of the block is inserted so as to facilitate handling without risk of fracture; the vertical bars B uniting all the courses of blocks. The body of the block C is moulded with a groove for receiving the horizontal tie connecting all the blocks of the same course. The stirrups E form a connecting-link between the vertical bars and the body of the blocks; and the cement mortar filling R completes the work. The rounded head at one end of each block serves the important purpose of a socket, permitting the diameter of successive courses to be slightly reduced as work progresses; thereby imparting the requisite taper to the shaft. It should be noted that the projecting ends of the blocks, as reinforced by the longitudinal bars and mortar filling, constitute vertical ribs which, besides imparting a pleasing appearance to the exterior, act as efficient counterforts to the shaft. As an additional precaution, the tower is braced internally by the reinforced concrete beams of the four upper floors; these members being about 5½ inches wide by 10⅝ inches deep, reinforced with steel bars in the customary manner.

At the upper end of the shaft, the bottom of the reservoir is supported by the aid of radial cantilevers and arched beams, the whole in monolithic reinforced concrete. The reservoir floor supports two circular concentric partitions, 27 feet high. The inner one, 7 ft. 9 in. diameter and 6 inches thick, is of reinforced concrete, moulded in shuttering as usual, and affords accommodation for the spiral stairway leading to the flat roof of the reservoir. The outer partition, with the diameter of 38 feet and the thickness of 7 inches, is built in courses of curved blocks similar to those employed in the construction of the tower, but without the projecting heads as fig. 3. To ensure perfect water-tightness of the reservoir, its outer surface is covered by cement mortar, 1 inch thick, plastered upon a layer of expanded metal.

The reservoir proper is surrounded by a third concentric wall built up of blocks of the same type as those in the shaft of the tower. This outer wall, being pierced by windows and situated at the distance of about 18 inches from the exterior of the reservoir, forms a narrow passage permitting the service of the latter to be inspected as often as may be thought necessary. It is surmounted by a cornice, carrying a balustrade around the terrace roof of the reservoir. The outer wall serves another useful purpose, in protecting the reservoir from extremes of temperature; the annular space enclosing an air cushion which acts as an efficient insulating medium. The tower is completed by a roof lantern, 20 feet in diameter and 8 feet high, giving light to the spiral staircase, and providing sheltered means of access to the interior of the reservoir. Above the roof of the lantern projects the chimney from the fireplaces in the workmen's living-rooms.

Owing to the saving of labour and material effected by the Monnier system, the construction of the tower was exceptionally rapid and economical. It was built for the Compagnie Internationale des Eaux de l'Agglomération—the operations having been commenced in February, 1909, and completed in the early part of the following September.

THE PREPARATION OF TAR-MACADAM.

In the course of the proceedings at the recent meeting, at Paignton, of the Institution of Municipal Engineers, the Surveyor of the Warminster Rural District Council (Mr. P. W. Harrison) read a paper, on the "Kentish Ragstone Quarries," in which he said that the "rag" makes excellent tar-macadam; being, by the nature of its composition, able to absorb an appreciable quantity of tar. Ragstone differs in this respect from most igneous rocks, which, by reason of their too compact or crystalline nature, are able to absorb only a very small proportion of tar, which in many cases is little more than a surface coating that soon wears off. The following are, he mentioned, the general methods adopted for the preparation of tar-macadam.

The ragstone, having been broken either by hand or mechanical breakers, is taken (after screening) to the drying floors, which are constructed of large metal plates under which flues from large furnaces run up and down, and laid to a thickness of 5 or 6 inches. It is allowed to remain spread for twelve to fourteen hours—generally through the night—by which time it is found to be thoroughly dried and the whole of the natural moisture evaporated. This renders it in a better condition to absorb the tar.

Water Absorbed, Expressed as Percentage of Volume of Stone.

Granite	0·5 to 3
Basalt	0·1 to 0·2
Sandstone	8·0 to 20
Portland stone	13·5
Bath stone	17·0
Ketton	15 1
Chilmark	8·6
Kentish rag	1·5

It is then mechanically mixed with boiling tar, at a temperature of about 180° Fahr., in revolving cylinders fitted with a continuous screw, and fixed at such an angle and in such a way that the stone is propelled forward and the superfluous tar is able to run back to the mouth of the cylinder. By this means, it is found that the stone on being discharged has absorbed sufficient tar not only to render it waterproof, but eventually, when pressure is applied, to form a homogeneous and concrete mass. On an average, 13 to 16 gallons of tar are used to every cubic yard of stone—varying according to the coarseness or fineness of the material to be treated.

A LONG AMERICAN GAS-PIPE LINE.

The Arkansas Natural Gas Company have commenced work on the construction of one of the largest pipe-lines ever attempted in America. The line, which is 235 miles in length, extends from the Company's holdings in the Caddo (La.) gas-fields to Little Rock (Ark.), with several branches to supply cities on the way. The following particulars are taken from "Progressive Age."

Sixteen miles of 12-inch pipe are laid in the Caddo field; and from Vivian (La.) to Hope (Ark.), a stretch of 61 miles, 16-inch pipe is used. From Hope to Gum Springs (Ark.), a distance of 50 miles, the pipe is 18-inch; while the 20 miles to Malvern is connected with a double line of 12-inch pipe. The remaining 38 miles to Little Rock is covered with 16-inch pipe; but before that place is reached, two branches shoot off, one to Hot Springs, a distance of 22 miles, in which 10-inch pipe is laid, and the other a 42-mile stretch to Pine Bluff, passing through Sheridan; the pipe in the last run being 12 inches diameter.

The contract for laying the pipe line has been awarded to a Pittsburg firm; and they have 200 men on the work. The line is to be constructed of plain-end pipe, with the sections connected by rubber-packed couplings, with the exception of one stretch of five miles, which will be of screw-end pipe, as it will serve the point selected for a gas-compressing station, consisting of three 1200-H.-P. units. Up to this point, a distance of 127 miles, the gas will be sent forward by the pressure at the wells, which varies from 465 lbs. in the upper sands to 1000 lbs. in the lower ones; or possibly two compressors may be installed near Vivian. The main line will have from 24 to 30 inches of covering. In order to supply enough gas to consumers on the coldest day, a maximum delivery of 40 million cubic feet will be required and provided for. The capacity of the pipe-line system is approximately this quantity per day, or 14,000 millions per annum, with an approximate earning capacity of $2,100,000. The plant is expected to be in operation by Jan. 1, 1911.

Gas v. Electricity at East Stonehouse.

A test of the comparative merits of gas and electricity for street lighting is to be made on a small scale at East Stonehouse. The township is peculiarly situated; for while it is supplied by gas by the Plymouth and Stonehouse Company, it is within the area of the Devonport Corporation for the supply of electricity, and the Corporation's generating station is actually in Stonehouse. Hitherto the streets have been lighted by gas; but at the request of the Devonport Corporation (who, as owners of the electricity works, are large ratepayers), a number of electric lamps are to be installed in the streets. On being informed of this, the Plymouth and Stonehouse Gas Company asked for permission to place some modern incandescent gas-lamps in prominent positions in the principal thoroughfares, in order that a fair comparison might be made between them and the electric lights. The Urban District Council have acceded to the request, and preparations are being made for the erection of the lamps. If it should be decided to continue the use of gas for street lighting, the Council state that they will require the Gas Company to establish and maintain a testing-station at the Town Hall. When the competing lamps are erected, the people of Stonehouse will have abundant opportunity of comparing the merits of the two forms of lighting. On one side of them is Plymouth, where the Corporation own the electricity undertaking and light the main thoroughfare up to the boundary of Stonehouse with electric arc lamps; on the other is Devonport, whose Corporation own both the gas and electricity undertakings, and where gas has quite held its own as a public illuminant. The gas lighting in Devonport and Stonehouse has been markedly superior to the electric lighting of Plymouth, and with greater rivalry better results may be anticipated in the future.

Cost of the Opposition to the Standard Burner Bill.—In the course of a statement on the finances of the city, at a meeting of the Exeter City Council last week, Mr. Loram mentioned that £150 had been spent in the opposition to the Gas Companies' Standard Burner Bill. Alderman Templer Depree asked if this was the whole amount of the cost, and was informed that it might not be all.

REGISTER OF PATENTS.

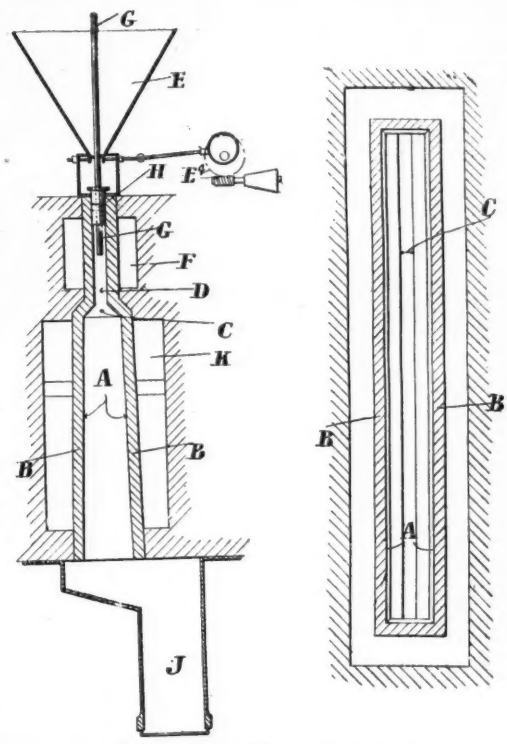
Vertical Retorts.

JOHNSTON, A. A., of Ealing, W., and CLARK, F. W., of Greenwich, S.E.
No. 19,196; Aug. 20, 1909.

This invention relates to continuous vertical retorts of the gravitation type where the coal is delivered into, and the major part of the gas generated at, the upper and most strongly heated zone, and then withdrawn from contact with the coal, "whether or not the withdrawn gas be afterwards subjected to controlled heat treatment."

According to the inventors' statement, "a comparatively large but (to ensure adequate heating throughout) a narrow body of coal—greater in horizontal length than vertical height—is heated so that the generation of the major and richest portion of the gas occurs at its upper portion. This gas, with gas generated in other parts of the body, is substantially vertically rapidly removed at or through and simultaneously over the major part of the upper surface of the mass; the treatment being rendered continuous by practically constantly feeding fresh coal to the upper portion of the body and correspondingly withdrawing carbonized residue at the bottom. The generated gas can be heated in a controlled and independent manner under such conditions that the non-gaseous matter falls vertically back to the coal being carbonized. Gas generated as described can be heated in regulatable manner in a superheater through which the coal from the source of supply falls to the main body of coal being carbonized."

They employ a vertical retort relatively narrow, open top and bottom, and of greater horizontal length than vertical height, and having, at or near the top, an outlet extending practically continuously over the major part of its length; the retort being continuously fed at its upper end with fresh coal, and the carbonized coal correspondingly withdrawn at the lower end. Preferably, the retort is of downwardly increasing cross section, and is used in conjunction with a chamber, adapted to be separately heated (termed a superheater), vertically arranged directly above the retort mouth, and into the upper end of which the coal can be delivered so as to pass through it by gravity to the retort. The means for heating the superheater and for otherwise regulating heat treatment of the generated gas are under separate control.



Johnston and Clark's Vertical Retort.

The superheater chamber is conveniently of the same length as the retort, but of less width. Suitable dimensions for a continuous retort according to this invention are (say) 5 feet high, 20 feet in horizontal length, and with a mouth width of (say) 4 or 5 inches—instead of, as is usual in such retorts, being (say) from 13 to 20 feet high and 10 to 12 inches wide at the mouth.

A "diagrammatic embodiment" of the invention is shown in vertical section and sectional plan as seen from below.

The retort A has confining side walls B connected (or not) by cross stays and of greater length than the vertical height, and which for the most part taper uniformly, but curve inwards or taper more quickly at the upper portion and terminate in an aperture C that forms the lower end of a rectangular vertical extension D, also provided with stays, if desired, which encloses a space that is relatively long in one direction and narrow in the other—constituting the superheater. The retort is heated most strongly at its upper portion by delivering a combustible mixture of gaseous fuel and air to, and effecting combustion within, the uppermost part of the flue K. The coal is delivered to the retort from a hopper E connected to the top of the superheater—through which the coal falls in its passage to the retort. The supply of coal from the hopper is controlled by a reciprocating valve constantly driven by

gearing that enables the speed to be controlled at will—for example, by worm gear and a conical belt pulley. Carbonized coal falls into the chamber J, whence it is withdrawn after removing the outlet cover below. The superheater is provided with adjustable pipes G (water or otherwise cooled, if desired) that pass through glands H at the upper end of the superheater, and facilitate the pipes being held in position after adjustment. The pipes can be caused to project any desired distance into the superheater—such distance of projection being capable of variation at will.

Gas entering the superheater from the retort can be subjected within wide limits to any desired degree of temperature for periods also capable of variation by altering the number and adjustment of the pipes G. For example, if it is desired to submit gas to a small degree of superheating, these pipes can be lowered so that the distance from the coal to the outlet is short. The size of the retort being used, together with the amount of superheating given to the gas (which varies with the description of the gas required), will control the number and area of the outlet pipes employed; such number and area being sufficient to adequately and rapidly carry away the evolved gas. Thus the gas passing away from the apparatus may be subjected to a small amount of superheating; while the full depth of the superheater is employed to heat the coal falling to the main body being carbonized. The space in the superheater above the lower ends of the outlet pipes is at the start filled with gas, which does not pass out of the superheater.

When it is desired to simultaneously produce a relatively rich gas and also utilize the superheater for preliminary heating and, it may be, partially gasifying the coal delivered through it, this can be accomplished by maintaining the superheater at a high temperature and only subjecting the gas from the retort to brief treatment in the superheater before removing it; the coal being thus subjected during the whole of its travel through the superheater to the high temperature prevailing, and "the relatively rich gas quickly removed from temperature conditions liable to become injurious."

Gas-Heated Radiators.

CANNON IRON FOUNDRIES, LIMITED, and HAWTHORNE, H. S., of Deepfields, near Bilston.

No. 21,688; Sept. 23, 1909.

This invention has for its object to provide a radiator or heating appliance for use in motor-car houses, laboratories, and works where explosive or combustible fumes or gases may be present, and where appliances with open burners cannot be used. The burners are enclosed within a fume or gas tight chamber having provision for the admission of a supply of air for supporting combustion at the burners within the chamber, while at the same time preventing the lighting-back from the burner chamber into the outside atmosphere of any fumes or gases that may be present in such atmosphere, or that may be carried into the chamber with the air.

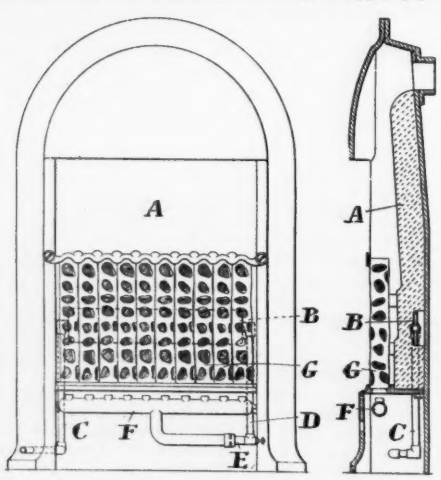
This result it is proposed to attain by forming in the walls of the enclosed burner chamber suitable air-admission openings, ports, or apertures which are completely filled with sheets of fine wire gauze which admit air for supporting combustion to pass through the reticulations or mesh and carry with it any combustible or explosive fumes or gases that may be present in the atmosphere, and which fumes or gases burn on the inner side of the gauze and within the enclosed burner chamber, while the flames caused thereby cannot strike back through the gauze or ignite any fumes that exist on the outside of the chamber.

Gas-Fires.

YATES, H. J., of Birmingham.

No. 23,082; Oct. 9, 1909.

To preheat the gas by waste heat from the fire, the patentee proposes to provide a flat or other tube or chamber (having a passage through it) at the rear of, or within, the usual fire-brick back, where it would not be exposed to the direct action of the hot gases. At its opposite ends, the tube is connected to the gas supply pipe and the



Yates's Gas-Fire.

burner respectively. By the action of the heat transmitted through the fire-brick back, the stream of gas flowing through the tube is heated before entering the burner. "Some of the heat which would otherwise be wasted is, therefore, returned to the apparatus, and, in consequence, a greater heating effect can be obtained than ordinarily from the combustion of a given quantity of gas, or a particular heating effect can be provided with less gas than is usually required." The invention may be applied to various forms of gas-fires, and may be embodied in a variety of different means.

In the arrangement shown—a front elevation, with the cover plate at the front of the burners removed, and a vertical section—there is arranged behind or within the fire-brick back A, out of the path of the hot gases, a flat tube B, having attached to its ends pipes C D respectively connected to the main gas supply pipe and the regulating tap E—the latter being in conjunction with the burner F. The back becomes heated by the fuel G and communicates some of its heat to the tube B, which is utilized for heating the gas flowing through the tube to the burner.

Continuous Distillation of Tar.

HUGENDICK, W., of Essen-Ruttenscheid (Ruhr), Germany.

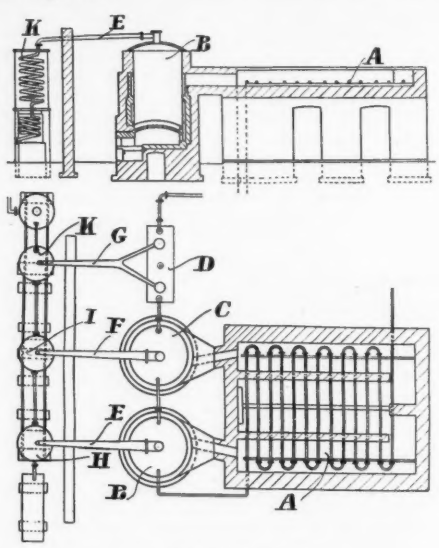
No. 23,766; Oct. 16, 1909. Date claimed under International Convention, Oct. 17, 1908.

This invention relates to a process for the continuous distillation of tar, which, the patentee remarks, has hitherto been generally carried out in stages, though there "have been processes according to which the distillation is carried on in a continuous manner." Thus, for instance, according to a well-known process, the tar is carried through a system of piping, in which it is raised by outer heating to a temperature of about 300° C. In the opposite direction to the heated tar, there is then introduced in a separate apparatus a jet of steam, which withdraws from it the volatile ingredients; so that the finished pitch is removed from the apparatus. The volatile substances are conveyed into condensers, in which the single compounds are separated.

According to another process, the continuous distillation takes place in several (for instance, three) stills arranged in series. In the first still, the separation from the untreated tar of the light and medium oils, together with ammoniacal liquor, takes place; in the second, the separation of the heavy or naphthalene oils; and, finally, in the third, the separation of the anthracene oils, so that pitch is obtained from the last still—the tar being heated by passage through a system of piping outside each still.

Both processes have considerable disadvantages. The first process necessitates the consumption of great quantities of heat, as the whole quantity of tar undesirably has to be brought to the highest temperature of distilling. Moreover, the separation of the volatile ingredients by condensation does not give pure products.

The separation of the different ingredients is effected according to the present invention, as in the case of the second process mentioned, during the distillation—namely, in several stills through which the tar passes successively; but in the present process, the tar is first deprived of water and light oils.



Hugendick's Tar-Still.

The tar in the plant shown is first carried through the condensers for the purpose of preliminary heating. After having been deprived of water, it is conveyed into the system of piping A enclosed in brickwork, in which it is heated by gases escaping from the furnaces of the stills B C, so that it enters the former at a temperature of about 350° C., and gives off in it the medium and naphthalene oils. The tar then flows into the still C; gives off therein the heavy oils; and passes into the boiler D, in which the ingredients, which are volatile with difficulty, are withdrawn from it, so that pure pitch is discharged from the boiler. The volatile ingredients are conveyed from the stills B C and boiler D, through the pipes E F G, into the condensers H I K. The light oils are distilled before the commencement of the process according to this invention.

Incandescent Gas-Lamps.

BIHELLER, S., of Chiswell Street, E.C.

No. 7178; March 22, 1910.

This is a modification of patent No. 8331 of 1907 so as to permit of the removal of the regulator for cleaning, adjustment, or renewal.

The illustration shows a sectional elevation of the lamp, and a sectional elevation of the regulator as it appears when the lamp is in use and in the position necessary for the removal of the regulator.

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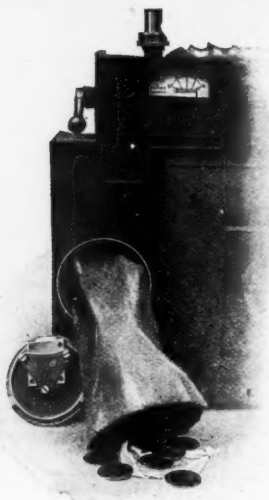
PATENT STRONG CASH BOX.

Showing Door of Box in Position.

Showing Coin Receptacle.



Showing Method of Emptying Coins.

FITTED TO **THE POSITIVE** PREPAYMENT METERS (WET OR DRY).

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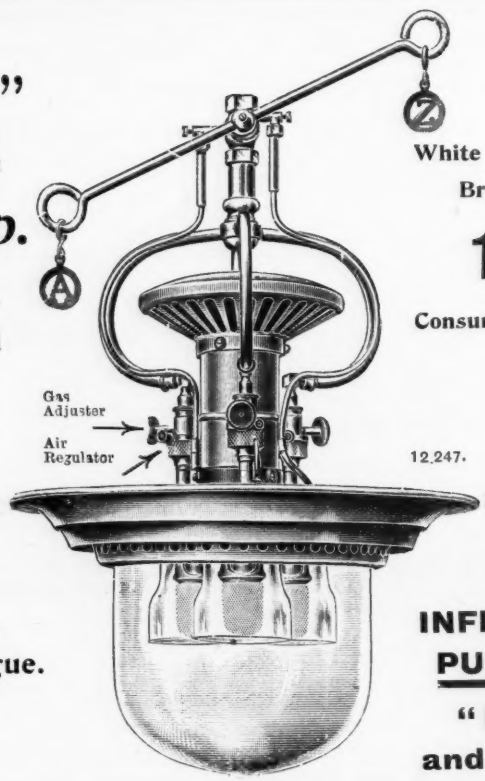

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Consumes about 4 cubic feet per Burner per hour.

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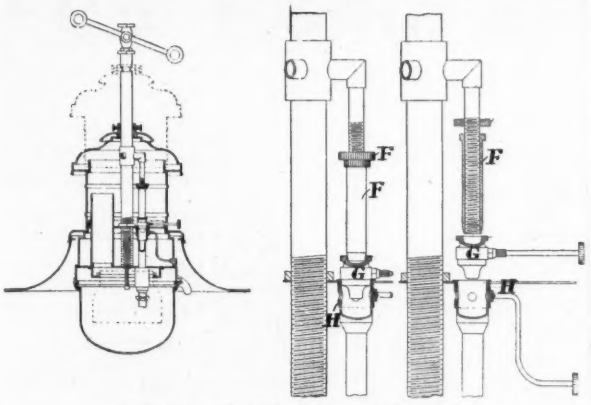
In order to permit inspection of the regulator, the pipe leading to the burner is divided into two parts. On the upper part, a sleeve F screws up or down; and this may be fixed in position by a locknut if desired. The lower end of the sleeve is tapered, so as to fit into a socket on the regulator G, the underside of which (formed as shown) fits into the upper part of the lower part of the burner pipe, so as to serve as, or lead into, the mixing-chamber. H is a hit-and-miss valve of usual



Biheller's Incandescent Gas-Burner Lamp.

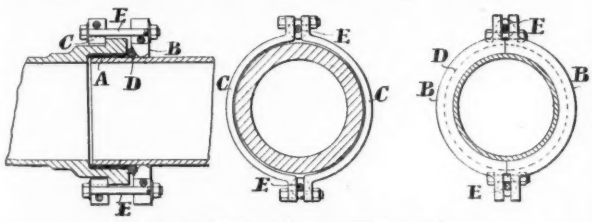
construction, with a handle for regulating it. When the lamp is in use, the parts are in the position indicated in full lines. If it is desired to have access to the interior, the lamp is raised and fixed as indicated by the dotted lines. If it is desired for any purpose to take out the regulator G, the top part of the lamp being raised, the sleeve F is screwed up, and the regulator may then be lifted out.

Joints for Gas and Water Mains.

FRANKS, E. A., of Ferndale, Glamorganshire.

No. 7717; March 30, 1910.

This invention consists of auxiliary jointing means which can be readily applied to a leaky main or to a main after the spigot-and-socket joints of it have been made or packed in any ordinary manner, and before the trench containing the main is filled up. The ring which surrounds the spigot is made interiorly of V-shape in cross section and of such size that when its two parts are bolted to the two-part ring which bears against the rear of the flange of the socket of the joint, the edge of the V-shaped ring will bear against the periphery of the spigot of the joint. Further, a packing-ring of circular shape in cross-section is used, and the front face of the V-shaped ring is made of such inclination that it will effectually force the packing-ring against the exterior of the spigot and the inner edge of the socket of the joint.



Franks's Joint for Gas and Water Mains.

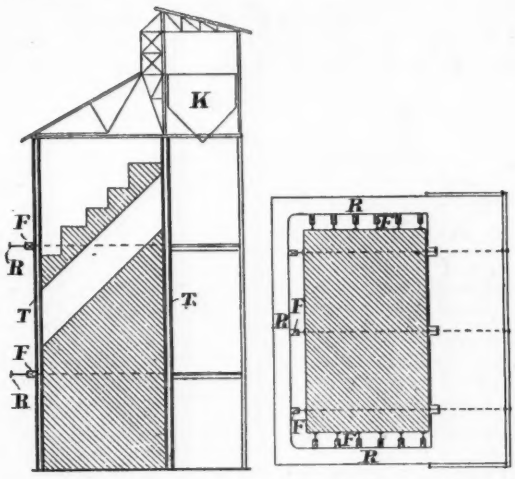
The spigot and socket has an ordinary packing A of lead wool or other material, forced into the annular space obtaining between the spigot and socket. B C are the two divided rings, and D is the india-rubber or like packing-ring, made of circular cross section. The ring B is of V-shape in cross section, and of such size that its inner periphery will, when it is in use, bear against the exterior of the spigot. The rings B and C (provided with lugs) are secured in position round the spigot and socket by bolts passing through holes formed in the lugs and nuts. Bolts E pass between the lugs and serve, in conjunction with nuts, as a means for drawing the divided ring C against the rear face of the flange formed on the socket, and for drawing the front face of the ring B against the packing-ring D, and the latter against the exterior of the spigot. The front face of the ring B has such inclination as to ensure that the packing-ring D shall be spread in the proper directions when the nuts are tightened—that is to say, that the ring shall be forced against the edge of the socket and the exterior of the spigot. The innermost part of the V-shaped ring B serves as a fulcrum on which the spigot portion of the main is free to move when there is any subsidence of the soil in which the main is laid without impairing the efficiency of the joint effected by the compression of the packing-ring D.

Gas-Retort Furnaces.

BENNINGHOFF, O., and KLÖNNE, A., of Dortmund, Germany.

No. 8369; April 7, 1910.

This invention relates especially to furnaces of considerable height arranged to contain inclined retorts or chambers. In such furnaces, the patentees point out, the front and rear vertical supporting bars, being of great length, have had to be made correspondingly heavy, as they could be anchored only top and bottom. Proposals have been made to secure them at their centres; but this plan has involved the passing of two anchoring devices through portions of the brickwork, where they very rapidly become burnt up. To obviate this defect, the inventors arrange, at suitable heights around the furnace, supporting frames, which enclose the vertical supporting bars; and between these frames and the vertical bars are springs, which allow for the expansion and contraction of the furnace.



Benninghoff and Klonne's Gas-Retort Furnaces.

T are the vertical supporting bars; R, the frames surrounding them and keeping them in position; and F, the springs arranged between the frames and the bars. The arrangement is such that the furnace can expand and contract both laterally and towards the front; the rear supporting framework serving at the same time for the support of the coal-hopper K. The frames R may be arranged at such short intervals apart that the bars T may be of comparatively light sections; "their weight being by means of this invention considerably reduced."

APPLICATIONS FOR LETTERS PATENT.

20,617.—CLARKE, R., "Rotary blowers and pumps." Sept. 5.
20,645.—GREER, D., "Reducing valve." Sept. 5.
20,668.—WINTER, W., "Continuous generation of combustible gas from hydrocarbons having high boiling-points." Sept. 5.
20,680.—ROWLEY, W., and CHAMPNESS, H. H., "Adjustable valve." Sept. 5.
20,700.—SOLARI, J., "Gas-main cocks." Sept. 6.
20,735.—SEARLE, W. S., "Lighting and extinguishing gas-burners." Sept. 6.
20,789.—PATERSON, R. H., and JENKINS, A. D., "Cocks and valves." Sept. 6.
20,794.—BAYER, C., "Purifying and cooling gases." Sept. 6.
20,804.—ANDERSON, D., "Street-lamps." Sept. 6.
20,805.—ANDERSON, D., "Starting or stopping clockwork movements for gas-controllers." Sept. 6.
20,811.—COLE, W., "Water-taps." Sept. 7.
20,813.—THORP, T. W., ALEXANDER, J., and RILEY, J. F., "Gas-engines." Sept. 7.
20,873.—BOULT, A. J., "Acetylene generators." A communication from Les Phares Willocq-Bottin, Société Anonyme. Sept. 7.
20,875.—HENSS, E., "Manufacture of sulphate of ammonia." Sept. 7.
20,923.—COVENTRY, W., "Inverted burners." Sept. 8.
20,965.—MEIJER, A., "Cocks or valves." Sept. 8.
20,967.—CORTHÉSY, J. H. & J. H., JUN., "Gas-turbines." Sept. 8.
21,008.—BROUSSEAU, G., "Measuring and distributing fluids under pressure." Sept. 9.
21,023.—KROGMANN, C., "Pipe-joints." Sept. 9.
21,048.—SOCIÉTÉ BARBIER, BENARD, and TURENNE, "Illuminating apparatus." Sept. 9.
21,058.—SIMMANCE, J. F., and ABADY, J., "Torch for lighting gas-burners." Sept. 9.
21,125.—BOHN, E., "Imitation candles for illumination by gas." Sept. 10.

Gas Matters in Sheffield.—In their report to the City Council, the Corporation Nominee Directors of the Sheffield Gas Company stated that the number of tests of gas made during the year was 2308, and the average illuminating power of the gas was 17·35 candles. The plant had been well maintained, and renewals and improvements of an important character effected, so that the Company were prepared to meet all the possible requirements of the city and district. The Company and the city generally had sustained a great loss through the death of the late Sir Frederick Thorpe Mappin, to whose energy and great business ability the success of the undertaking was largely attributable.

Municipal Profits and Income-Tax.—In submitting the Electricity Committee's minutes to the Mansfield Town Council, the Mayor (Mr. J. H. Collins) referred to a letter from the Ratepayers' Association which urged that the payment of income-tax should be avoided by reducing the price of current. He said that no doubt the writers thought it was wicked to go on paying £700 a year income-tax when they might save it by reducing the price of their commodities. On going into the matter, however, the Committees found it was not in their power to do away with the income-tax, because nearly nine-tenths of the amount paid was not on the net profit of the undertakings, but on the gross profits. They had to pay income-tax on the sinking fund, whether any profit was made or not.

MISCELLANEOUS NEWS.

BELFAST GAS-WORKS EXTENSION.

The Twin Island Site Abandoned.

A Special Meeting of the Belfast County Borough Council, convened in pursuance of a requisition signed by 34 members, was held on Monday of last week, for the purpose of considering the advisability of rescinding a resolution passed last March selecting the Twin Island site for the proposed auxiliary gas-works. At the outset of the proceedings, a deputation waited upon the Council, to protest against an extension of the gas-works being made in the Ormeau Road—as they had heard might be done.

Alderman Sir JAMES HENDERSON, in moving the rescinding of the resolution adopting the Twin Island site, said he wanted this course to be adopted in order to make room for the introduction of proper arrangements for the continuance of gas manufacture in the city. The shipbuilding industry was one of the most important in the city; and the West Twin Island was to be removed, as it was thought it might interfere with the successful launching of certain large ships. In the course of a few years, the East Twin Island might also have to be removed to provide for future developments; and they should be careful to avoid pursuing any course calculated to interfere with the shipbuilding interests. Much expenditure was contemplated by the Council in other directions; and he therefore thought that this was not a time when they, as a body representing the ratepayers, and responsible for the outlay of the latter's money, should be thinking of such an enormous scheme as the removal of the gas-works to the Twin Island site. It meant, he believed, the sinking of a huge sum of money, which would never be seen again. By the exercise of common-sense, led, he hoped, by the Chairman of the Gas Committee, and members of that body, this expenditure might be obviated. He thought that the opinion of the new Gas Manager on the question should not be taken until the Corporation had decided upon the subject. Certainly, his opinion would have no weight with him (Sir James); for he had already made up his mind on the question.

Mr. CURLEY seconded the proposition; remarking that it was not his intention to enter into details as to the relative merits of the site as compared with others. He preferred to confine his remarks to the general aspect of the question, and to avoid trenching on debatable ground. It could not be denied that the somewhat congested condition of the present works must be relieved. He maintained from the first that two gasholders on the old abattoir site, with its area of 4 acres, would be ample to meet the case, and he had voted accordingly. He believed firmly that, when the matter became clear to the minds of the Council, a more economical view would force itself to the front, and relief for congestion would be found nearer home than the Twin Island. He approached the consideration of the matter with a perfectly open mind, but was not able to shake himself clear of the ever-present fact that, with 432 retorts lying idle, it was not so much a question of production as of additional storage, with purifying plant and ground for coke. In order to find out the time at their disposal for considering the means of relief, he communicated with the late Manager, Mr. R. Sharpe, and in that gentleman's amended reply to his queries, he learned that the present plant was ample to meet all their requirements for 7½ years. There was, therefore, ample breathing time to approach the solution of this great question without undue haste. On carefully examining Messrs. Hunt and Herring's report, the first thing that struck him with amazement, and influenced his vote, was that the Twin Island scheme was called an "auxiliary gas-works." A more misleading title could not have been applied. Let them consider for a moment the fact that their total production of coal gas in this age of electricity was met by the carbonization of 103,000 tons of coal last year, and let them bear in mind also that this was the year of their gas exhibition. When this was compared with the proposed carbonization of 130,000 tons of coal on the Twin Island, as set forth in the report—and that only for the first section of the new works—it would at once become apparent that there would be no further need for the Ormeau Road works. This in itself was quite sufficient to topple over the present works into the scrap heap. But in order that there should be no doubt as to the ultimate fate of the present works, the second section of the new works on the Twin Island came in with its quota of another 130,000 tons; and over and above all this came in the Committee's decision for duplication. Let them think for a moment what the carbonization of 260,000 tons meant. It was more than two-and-a-half times their present requirements; and at the present rate of consumption per head would mean a population of close upon a million. Those who were acquainted with the city and its possibilities of future development would readily agree that history furnished no parallel of a prophecy so absurd. Recent newspaper correspondence had thrown much additional light on the question, and had shown clearly the possibility of utilizing ground adjoining the present works for all necessary extension and modernization; and if this suggestion should commend itself to the wisdom of the Corporation, he had no doubt whatever that they might reckon on the hearty support of the ratepayers. It had advantages that were not obtainable in the Twin Island site; and if the extension he had indicated came up for consideration later on, he, for one, would give it his most hearty support. In conclusion, he wished to point out to those members of the Corporation who in their haste would rush to the Twin Island, that the history of the Edinburgh new gas-works formed a useful object-lesson that should be kept before their minds. A few years ago, the people of Edinburgh believed their old works to be like Belfast's—that was, in a congested condition—and their experts pointed out a remedy disastrous in its results. One hundred and twenty acres of land were purchased, and new works were erected thereon, costing over £1,000,000. Their Edinburgh friends had now the luxury of new works; and though in the very centre of the coalfields of Scotland, their gas cost consumers something like 3s. per 1000 cubic feet. He had no hesitation in saying that, if they allowed themselves to be led to the Twin Island, they would be sure to arrive at a similar disastrous experience. There they were, on the Ormeau Road, far away from all coalfields, paying sea freights and railway rates for coal and every other requisite, and yet their net price for gas did not exceed 1s. 10d. per 1000 feet; and at this exceedingly low figure, their present works contributed about £30,000 a year in relief of rates. The idea of "scrapping" such works was outrageous, and would be resented by the ratepayers of the city. He appealed to the members of the Corporation with all the energy he possessed to disabuse their minds of the fallacy that 8½d. per ton saved in the transit of coal to the Twin Islands outweighed all the advantages of extension of the present works. This was only an item, and when compared with the disadvantages of foundations and the enormous expenditure connected with preparation of the site before building operations could be started, it fell into utter insignificance, and should never be considered as the deciding factor in the matter of selection. Reckon it as they would, their escape from the Twin Island site, as compared with the Ormeau Road site, meant a saving to their already heavily taxed city of an enormous sum—certainly over £500,000.

Mr. ROBERT JOHNSON expressed the opinion that to "scrap" the present gas-works and build another at a cost of about £1,000,000 would be a really tremendous jump to take.

Alderman FINNIGAN said he thoroughly believed that they should consult the best men available on the important subject before them. It was true that they had a number of retorts idle; but this was because of an action in the Chancery Division.

Mr. CURLEY: Is there an injunction against 432 retorts?

Mr. J. A. DORAN (the Chairman of the Gas Committee) replied that there was an injunction in regard to something like £60,000 worth of property.

Alderman FINNIGAN (continuing) pointed out that it was idle for Mr. Curley and other members of the Corporation in favour of extinguishing the idea of using the Twin Island site to attempt to blind others to outstanding facts. The Corporation dared not extend the Ormeau Park site, because of the residents in the neighbourhood. While it was interesting to learn the extent of their liabilities, it should not be forgotten that financiers were always glad to advance any sums that the city required. He agreed with Alderman Sir James Henderson that the proximity of the shipbuilding works constituted an insuperable objection to the adoption of the Twin Island site. Why should they set down a gas-works in juxtaposition to great firms, when there was danger from effluvia and gases, and thus jeopardize and perhaps destroy the fine paint work and fittings of these great steamers? Their new Gas Manager (Mr. J. D. Smith) was a man of the highest capacity, and possessed of the best credentials; but he had not been consulted in any way in regard to the question which they were debating. He (the speaker) was altogether opposed to any extension at Ormeau Road; and he would do his level-best to prevent anything of the kind in that vicinity.

Mr. HENRY JOHNSTON said he had a strong conviction on the subject; and he would rather resign his position on the Corporation than give a vote in favour of the rescinding of the resolution. The matter was thrashed out for many months in committee with their Engineer; and they came before the Council unable to give a recommendation as to the site, because they did not consider themselves sufficiently well-informed on the subject. It was, therefore, decided that the very best information possible should be secured; and they selected experts, who submitted an exhaustive report. After taking these steps and receiving the report, were they now going to take the responsibility, as laymen, of departing from the recommendation of the experts, or were they going to have further experts, who would, perhaps, report in accordance with the wishes of some members of the Corporation? They would make themselves a laughing-stock throughout the kingdom, if they cast aside the report of the experts and tried to act for themselves. Was it a fact, as stated in the report of the experts, that, in the first year of the working of the Twin Island auxiliary works, they would effect a saving of £4500 in the transit of coal alone? If it was a fact, then they would stultify themselves if they threw away this amount by bringing coal up to Ormeau Road. If they dispensed with the large amount of water gas that they were making at the present time, they would double their saving on coal. Some very ridiculous things had been said there that day. He did not think there was a city in the United Kingdom that had more available ground for shipbuilding purposes than they had in Belfast; so that the taking of the Twin Island site would not interfere with possible developments in this direction. It was also unfair to suggest that those who advocated the Twin Island site had any intention of "scrapping" the present gas-works. He felt that, in face of the existing congestion, it was serious for them to postpone the settlement of the matter any longer; and if any accident occurred, they would find themselves in a bad position. They were spending as much money—nearly £6000—in shifting material from place to place in the present works, as would pay for the site they had determined upon.

Mr. SQUIRE said the Gas and Law Committees had, as instructed, gone to the Harbour Commissioners to take the necessary steps for the acquiring of the Twin Island site; and they would be placed in a very unfair and invidious position if they had now to go back to the Board. They were distinctly asked by the latter if they had power to deal with them; and they replied that they had perfect power, and that the Council had definitely settled that the Twin Island was the place for the auxiliary gas-works. Now it was proposed that they should tell the Harbour Board that they had made a mistake. Mr. Sharpe, in a report in 1907, said the site of the existing works was so overcrowded that there was not room to carry on operations in an economic manner, and suggested that they should make provision ample for the next 20 years. Mr. Curley took the question of the 130,000 tons of coal; but he did not take into account that the water gas did not require coal; that the manufacture of that gas was going to be reduced; and that the 100,000 tons they were using at present was going to be increased to about 130,000 tons. What was the good of rescinding the resolution unless something else was to be brought forward? He thought they knew what was underlying it. Down by the side of the river were 24 acres of land, which he (the speaker) had been inquisitive enough to visit; and he would like to know if the writer of certain letters in the papers was the agent for any of that property. If so, he was not surprised that he

wanted the Corporation to rescind the resolution. It was monstrous for an enlightened city like Belfast to go back a hundred years and put gas-works in the best part of the city, in preference to placing them right away. Though it might seem a startling statement, he did not think the present gas-works were a good paying concern. The capital amounted to £700,000, and they had £26,000 profit; but if they took off £8000 or £10,000 for depreciation, the profit would only represent something like 2¼ per cent.

Mr. M'CLURE suggested that, by removing a lot of slum property, they could consolidate the gas-works on the present site; and they would not have to touch the Ormeau Park site, which would mean indefinite delay and serious trouble with the ratepayers. Now that they had got a new Manager, who was acknowledged to be an expert, they should instruct him to bring up a plan on the lines indicated—straightening the river and taking in the slum property right and left of the present gas-works site, and, of course, the site of the old abattoir. If they could make on the present congested site gas enough for nearly 400,000 people, he maintained that, with new appliances and up-to-date knowledge, an addition of some 11 or 12 acres should be ample for extension purposes.

Mr. RIDDELL voiced the opinion that the talk about the immense expenditure which the Twin Island site would involve was a mere myth. To carry out the work indicated on a plan which had been presented to the members of the Committee, though it had not been before them at any of their meetings, an expenditure of from £130,000 to £150,000 would be necessary, exclusive of the cost of the land. And this was in respect of a comparatively small scheme. A great difficulty arose in regard to the storage of coke. It was necessary to store winter coke for consumption in the summer; and there was no doubt that the space available for this purpose was exceedingly small. More room was required; but the Corporation had pledged themselves to increase the proportion of coal gas from 50 to 75 per cent. And he might say that, in doing this, they were not even approaching what had been done by municipalities on the other side of the Channel. In order that they might extend the life of their present works for a period of about five years, it was suggested that they should at once spend from £130,000 to £150,000, and also buy the ground which was valued at another £20,000. The Corporation had to take into account the increasing consumption, which during the five months of the present municipal year amounted to about 5 per cent. Reference had been made to the gas undertaking at Edinburgh; and he thought they should remember the difference in illuminating power between Edinburgh gas and Belfast gas. Threepence per 1000 cubic feet was the legitimate difference in the cost for candle power alone. There was also the difference between English and Scottish coal to be taken into consideration.

Dr. TRIMBLE said it was an extraordinary thing that people who had nothing to do with the Gas Committee should bring this matter forward. It had already been deliberated upon; but the resolution was introduced without any alternative. This was absurd, and would not be heard of in any business place. "Cutting the painter" and "scuttling the boat" at the same time were acts of foolhardiness.

Mr. DORAN remarked that he never was in favour of the Twin Island site; but when two eminent experts were brought in and gave an opinion, he was bound to go by their decision. He himself had been accused of self-interest in connection with the negotiations; but his only desire was the acquisition of the cheapest site. Sentiment overcame the Corporation in regard to the Ormeau Park site; and it was thrown out. Who was to say that the Ormeau Road was not the proper place for the extensions? It was convenient; and they would not have to separate their works. Gas was now being manufactured by vertical retorts, by the use of which they could produce 2½ million cubic feet per day, or sufficient for five years to come; so that they need not talk about a gasholder, which would cost from £60,000 to £70,000, since they would have to put one up no matter where they went, and at the Twin Island they would require two or three. There was an increase each successive month in the demand of some 5 per cent.; and some steps would have to be taken. Something had been said about an alternative scheme. This, he thought, should be the Ormeau Road—vertical retorts replacing the horizontal type. This would meet their requirements for fifteen or twenty years.

Mr. PHILLIPS suggested that, before any further steps were taken in the matter, the new Manager should be requested to report upon the whole subject. When the Chairman of the Gas Committee circulated information showing additional areas which could be had to the south of the old gas-works, and in close proximity to it, he (the speaker) was naturally startled, and made a personal investigation; and his partiality for the Twin Island site sustained a rude shock when he heard Mr. Doran observe that a gas-works on the Twin Island would soon lead to the "scrapping" of the old gas-works. On mature consideration of the subject in all its bearings, he (Mr. Phillips) had come to the conclusion that they should not rashly decide to go to the Twin Island if they could get about 10 acres, as an immediate instalment of a further 20 acres or more, available for a possible development. This was not likely to come, considering the strides which the science of gas engineering had made, was making, and would likely make in the immediate future.

Mr. SHAW thought it was a great matter for the ratepayers that the Harbour Commissioners had not closed the negotiations, and the difficulties had been raised by their Solicitor that would enable the Corporation to retire from a bad bargain with grace and dignity. Personally, he never was in favour of the Twin Island site; and he thought the arguments used that day by Alderman Sir James Henderson were proof positive that at least the thoughtful and the large ratepayers of the city were prepared to endorse the contention that it would not be in the best interests of the city or of the Harbour Commissioners' property, in view of probable extensions in shipbuilding, that the gas-works should be erected on the Twin Island site. The argument as to the saving on the transit of coal if the latter site were adopted had again been trotted out; but not a word had been said as to the loss entailed in the handling of cinders or coke from the gas-works. However, the real question with him was: "Does Belfast need new gas-works?" Outside the Council Chamber a feeling existed that they could very well afford, with slight developments, and with the introduction of some new retorts of an up-to-date character into the existing works, to go on for many years to come, without rushing into what might cost from £700,000 to £1,000,000.

Several other members spoke on the question; and then the discussion was wound up with some remarks by

The LORD MAYOR (Mr. R. J. M'Mordie), who pointed out that if the Council adopted some other site than that already approved of, they would most probably experience some difficulty when they went to the House of Commons. If, for instance, they proposed to utilize the Ormeau Park site, they might find that Parliament took a keen interest in the preservation of spaces for the recreation of the public. Then, again, they had obtained a report from experts, acting upon which they arrived at a certain decision; and though they probably knew a good deal more about the question in the Council Chamber than was known in the House of Commons, still, if the matter was raised in Parliament on the consideration of a Bill, he did not believe that a single remark made there that day would have a particle of weight. They would be referred back to their decision on the report of their experts—a decision which, as some members apparently overlooked, was unanimously arrived at. They might say they wanted another site; but the answer would be that the Twin Island site was described as the best possible one, situated where it would not inconvenience anybody. This was the view of the question that appealed to him; and he thought the best thing would be to adjourn the matter. If they passed the resolution that day, the Harbour Commissioners would be in a position to stop negotiations; and he believed they would like to do so, judging from a conversation he had had with one of the members. If negotiations were broken off, the Corporation might come back to the same position twelve months hence, and want to re-open the question, when they would probably find a site suggested half-a-mile further down the river, and perhaps at a higher rent. He was afraid if they came to negotiate again they would find themselves in an embarrassing position.

Mr. CURLEY said the Lord Mayor had referred to the previous resolution as having been carried unanimously. He thought when the vote was taken in March the numbers were 14 to 23.

The LORD MAYOR agreed that there was a division of opinion; but when the matter finally came up, he said, it was passed unanimously.

Alderman Sir JAMES HENDERSON: I am afraid there is some lapse of memory there.

The resolution was then put to the meeting, and declared carried. A poll was demanded, and taken, with the following result: For the resolution, 25; against, 7.

It was subsequently unanimously agreed—"That the whole question of the extension of the gas-works be referred back to the Gas Committee, with instructions to confer with Mr. J. D. Smith, the new Gas Manager, as to the possibility, with the adoption of modern machinery, of utilizing the present gas-works for some years to come."

THE DEATH OF MR. STELFOX.

A Vote of Condolence.

At the opening of the proceedings when the Belfast County Borough Council met on Monday of last week to discuss the question of the proposed gas-works extensions (as reported in the opposite page), feeling reference was made to the late Mr. James Stelfox, whose death it is our regret to have in this issue to record.

The LORD MAYOR (Mr. R. J. M'Mordie) said he was sure they all deeply regretted to hear of the death of Mr. James Stelfox, who was so long and honourably associated with the Corporation. He thought a formal resolution on the subject should be moved; and he would ask the Chairman of the Gas Committee to do this.

Mr. J. A. DORAN said he could assure the Council that, on taking up his paper that morning, he was greatly surprised to read of the death of Mr. Stelfox, who had been one of the bulwarks of the Corporation. In fact, he made the gas-works what they now were; and if it had not been for him, the ratepayers would not have gained to such an extent as they had done from this department of municipal enterprise. He moved—"That the Corporation have heard with feelings of the deepest regret of the death of Mr. James Stelfox, M.Inst.C.E., who for over thirty years acted as Manager of the gas-works, with credit to himself and profit to the community. His wide knowledge, his unfailing courtesy, and his unswerving probity combined to make him an ideal official; and it is to be regretted that he enjoyed his well-earned rest for so short a period. To the members of his sorrowing family the Corporation desire to tender their sincere and heartfelt sympathy."

Alderman Sir JAMES HENDERSON, in seconding the motion, said he was pleased that the note of sympathy with the family of the late Mr. Stelfox had been struck by the Lord Mayor from the chair. If ever there was an official who had deserved the esteem of the Corporation, it was Mr. James Stelfox. He (the speaker) had had the pleasure of intimately knowing Mr. Stelfox for many years—ever since he came into the Corporation—and he could say that they had never had an official in an important position who more faithfully performed his duties. He was a man who thoroughly understood the details of the business which he had to control. He started with the benefit of the training he had received from his father, who preceded him in the management of the gas-works, and, added to this, he was possessed of great ability. He was therefore in every way well qualified for the position which he was called upon to fill; and he (the speaker) believed it would be a long time before they looked upon his like again.

Mr. CURLEY said he had known the late Mr. Stelfox for many years, and had always found him a thoroughly upright man, and one who honestly tried to do his duty to the ratepayers. He could only hope that the Manager who was recently appointed would succeed as well as Mr. Stelfox did.

The motion was carried in silence; the members and officials of the Council standing.

Some original "A" shares of £5 in the Littlehampton Gas Company have just realized from £11 13s. to £11 15s. each. The dividend on the shares has been 11½ per cent.

MELBOURNE METROPOLITAN GAS COMPANY.

The Half-Yearly General Meeting of this Company was held at the Offices in Melbourne on the 28th of July—Mr. JOHN GRICE, the CHAIRMAN, presiding.

The Directors reported that, as the result of the recent coal strike at Newcastle, which terminated in March last, it would be seen that the items in the revenue account representing the cost of coal and the returns from coke were considerably higher than in past half years. The net profits for the six months, including a balance of £2210 brought forward, amounted to £84,166. They recommended the payment of a dividend at the rate of 5s. per share, amounting to £42,860. A sum of £25,000 had been transferred to the reserve fund, £2500 to the meter renewal fund, £10,000 to part meet the extra cost of coal during strike, and £1500 to the gas-stoves, &c., account; leaving a balance of £2306 to be carried forward.

The CHAIRMAN, in moving the adoption of the report and accounts, said the past half year had in two ways been eventful in the history of the Company. First, they suffered severely by the strike of coal miners at Newcastle and Maitland, which terminated in March last. All must feel the miners were ill-advised in striking; and they returned to work after five months' idleness, having gained nothing, not only with their own resources greatly depleted, but having impoverished many other workers not so well off as themselves, and having caused great loss to almost every manufacturer in Australia, and especially to those engaged in the gas industry. Provision had been made in the last and present balance-sheet for the loss sustained; the reserve fund being debited with the portion unable to be met out of revenue and expenditure account. While regretting the loss to the Company of a large amount of money, the Board might legitimately congratulate the shareholders that they had established large reserves of coal prior to the strike, and that by the immediate order of additional supplies from England and elsewhere, they were enabled to pull through this protracted period without interruption to the maintenance of a full supply of gas; and, further, that this was accomplished without having raised the price to the public during the most lengthened strike they had yet experienced, or ever anticipated experiencing. The second way in which the half year had been eventful was that probably never had a journal been so bitter and persistent in its attacks on any gas company as had one of the leading morning papers latterly been on their Company. For some years the "Age" had, in the opinion of the Directors, shown by its articles that the Company could not hope for any friendly feeling, or fair treatment at its hands. Since, however, what might be called the infatuation for electricity—whether in the form of traction, 'ghting, or heating—seized upon it, it had, as far as one could judge, done, and was continuing to do, all in its power to injure the Gas Company's business and reputation. At previous half-yearly meetings, and in other ways, the Directors had endeavoured to counteract somewhat similar but milder treatment, by placing the truth before the public, but not directly referring to that journal. In view, however, of these latest virulent attacks—always brought under the notice of the public by being placed in the most prominent part of the paper—and notwithstanding the Board's recognition of the powerful source from which they emanated, it seemed the duty of the Board of Directors to come out in the open, and unhesitatingly and publicly assert that many of the statements were contrary to fact, and, furthermore, that, as they were persisted in and reiterated time after time, notwithstanding their having been often refuted, it seemed there was no desire on the part of the "Age" to know the truth. The Company had no quarrel with their friends of the electrical industry, who could only be congratulated on getting such splendid advertisements free of cost to themselves. The Company had no monopoly for lighting the city or suburbs, and were willing, as they felt sure the suppliers of electricity were, to take the risks of competition—being satisfied that, with fair play, they could more than hold their own, as almost every gas company in the world had done, and was doing. They knew, comparing gas and electricity, that for lighting gas was by far the cheapest and, in their opinion, the best illuminant—even compared with the fragile metallic filament—provided the consumers would use the class of burners most suited to their requirements. As for heating, no serious comparison could be made. But were the Company getting fair play? Every thinking person must know and feel they were not; for the "Age" apparently relied on the old, but vulgar proverb, "Throw enough mud, and some of it will stick." Some of the earlier articles were commented upon in a letter to the Editor by the Secretary; and though this was courteously published, it was not given in so prominent part of that journal's columns as the statements to which it was a reply. In order to show those who had not read the articles the shape which this misrepresentation had taken, he would give a few extracts from them.

On Aug. 6, 1909, the following appeared—

The more, therefore, that the Company extorts, the greater becomes its power of extortion. Under this arrangement, the Company whose capital is £857,000, could be forced to sell only at a price of £2,541,000.

On Feb. 26, 1910—

But anyone who reads the electrical journals, marks the progress and cheapness of electric lighting, and makes practical comparison of the cost of both services, will arrive at the conclusion that the days of gas are numbered, that the time is not far distant when every new house, no matter how small, if it be within the area of an electric supply, will be installed with electrical fittings; that worn-out gas equipments in houses where electricity is available will be supplanted by electric wires and lamps, and unless a large reduction in the price of gas, that it will even pay the householder to scrap his chandeliers and gas-brackets, or tolerate them as a harmless encumbrance, and substitute or duplicate them with electric lamps. The revolution in electric lighting, which has eclipsed gas both literally and commercially, has been brought about by the introduction of the wire lamp. At any rate, the public should know that electricity is cheaper than gas; and when this is clearly proved, as it has been in England, electric lighting will soon come into general use.

On March 3—

This is the condition of the city electric lighting supply; and while it is maintained, the gas monopoly will continue to squeeze enormous profits out of the public. Great influence is exercised by the Gas Company. Has it caught the City Council in its paralyzing grip? We know that it has blocked in every way the extension of electric lighting in Melbourne. The Company cannot surely have the power to induce the City Council to go slow, so that the gas monopoly may be maintained. It might be an ugly, unhealthy, uncomfortable light; but it was cheap. The wire lamp has deprived gas of its last claim to toleration. The incandescent gas-burner may achieve good results under test conditions in the laboratory; but illumination in the home is a very different thing. The metallic filament gives as good results outside the laboratory as inside. From whatever point of view electric lighting may be regarded, its superiority to gas is justified.

On March 7—

The City Council is in a position to supply electric lighting for domestic purposes at 5d. per unit—a price equivalent to about half the cost of gas as supplied by the Metropolitan Gas Company at 5s. per 1000 cubic feet; and the quality of the light, moreover, is in every way superior to gas.

And on the same da'e—

It has been repeatedly demonstrated that the Gas Company squeezes enormously inordinate profits out of the people. It could supply Melbourne with gas at 2s. 6d. per 1000 cubic feet and still pay its shareholders handsome dividends. As it is, the Company charges twice this figure; and so prodigious are its surplus earnings, that it is obliged each year to divert a large proportion from the ordinary course of distribution to be employed in the building up of great unnecessary sinking funds in order to keep within the terms of its Charter. The City Council is well aware of this. It knows that the Gas Company is a monopoly in the worst sense of the expression, and that it is waxing rich by grinding the faces of the public. It is no exaggeration to say that not one householder in ten is yet aware that by purchasing electric light from the City Council he can obtain a far better light at half the cost of gas.

On March 10—

The day is not far distant when gas as an illuminant will be as antiquated and as despised as the cable tram.

I quote now from the "Age" of May 13—

It is glaringly obvious that the Melbourne Gas Company has been charging its customers an extortionate price, and that it has been piling up unconscionable profits. Its profits, as we have indicated in former articles, are not revealed in dramatically large dividends, but are hidden away in the shape of reserves, in order to evade the provision of the Statute of its constitution. Clearly, then, the people of Melbourne are being despoiled in the most flagrant and barefaced way. Their quarrel, nevertheless, is not so much with the Gas Company as with the City Council.

On June 25 this appeared—

Clean and convenient electrical illumination in comparison with expensive, dangerous, inefficient, and obnoxious gas.

Again, referring to our Secretary's letter—

Numerous householders will examine their gas bills to realize whether the Company is carrying out its contract. It was a most foolish boast to make, for a moment's thought on the part of anybody who read the statement would have shown its glaring absurdity.

Again, on June 25—

In fact, this is a universal experience, and unless Mr. Hinde has in mind some phenomenal kind of burner that has never been neard of in Melbourne, he grossly exaggerated the capacity of the incandescent mantle.

On July 9—

Practical experience proves almost daily the superiority and greater cheapness of electric lighting as compared with gas.

And, finally, on July 16—

How long are we going to be exploited by the Gas Company by paying for gas for cooking at the rate of 5s. per 1000 cubic feet? On the contrary, the Gas Company has held the public by the throat and kept its hand there, until compelled to relax, not by decency and fair play, but by the cold, callous consideration of business and self-preservation. The Company has paid enormous dividends; piled up magnificent reserve funds; has squeezed the public almost to the final limits of tolerance and submission.

These were some of the assertions that had been placed before the public, and, referring to these extracts, it would have been noted that they were generally to the effect that gas lighting had been superseded by electricity, both literally and commercially, and deprived of its last claim to toleration by the electric metal filament lamp; that the public should know that electricity was cheaper than gas; and that, by purchasing electricity from the City Council, the householder could obtain a better light at half the cost of gas. It would be further observed that these statements were made, not as matters of opinion, but as absolutely definite conclusions of fact. The newspaper in question also stated that the Company was a monopoly, building up great unnecessary sinking funds, that it was squeezing enormous profits out of the public, piling up unconscionable profits in the shape of reserves, and despoiling the people of Melbourne in the most flagrant and barefaced way. Very bold statements, were they not? As regarded the days of gas being numbered, and gas lighting being superseded by electricity, he (the Chairman) might mention that in Paris in 1908 it was decided to erect additions to the gas-works at a cost of £1,880,000 to satisfy immediate requirements; and the Prefect of the Seine, about three months ago, recommended to the Paris Municipal Council to go to an additional expenditure of £6,400,000 net, to meet the future demands of gas consumers. Neither did it look like gas being superseded, when the Lighting Committee of the City of London, after visiting the chief cities of the Continent, unanimously decided to recommend the Corporation to adopt for street lighting compressed inverted incandescent gas, instead of electricity; and within the last two months what would appear to Australians (who were more accustomed to the West-End than to the City of London) a greater victory, had been gained—the Westminster Corporation having decided to do away with the electric street lighting—which had been installed for years—in Regent Street, Piccadilly, Piccadilly Circus, St. James' Street, Pall Mall, and Waterloo Place, and to substitute compressed gas, to be supplied by the Gaslight and Coke Company. The Chairman of this Lighting Committee had recommended that the tender of the Gas Company should be accepted, and said that they would get 50 per cent. more light for the same price; that, as regarded advantages in the matter of colour, it was all on the side of gas, for flame arc lights gave a yellow light, prejudicial to goods displayed in the windows; and that, as business men, they had no choice but to accept gas. He also stated that many of the modern cities were abandoning electricity for gas because it was cheaper. The

City of Berlin was an even more striking instance of the tendency towards adopting gas for street lighting. The authorities there decided upon an expenditure of £350,000 (which was being spent at the rate of £50,000 per annum) in installing the latest patterns of high-pressure gas-lamps, with inverted burners, in lieu of the existing gas and electric lamps. This was to be completed in four years' time; and in future incandescent gas lighting only would be used in Berlin. This was sufficient as regarded public lighting; and it clearly proved that gas was gaining on electricity, so far as street lighting was concerned, instead of the reverse being the case. In the matter of private lighting, the Board of Trade returns showed that in the year 1908 the number of gas consumers in the United Kingdom was 5,900,000, as compared with 3,250,000 ten years previously. In Sydney, gas was making great strides; and locally the shareholders knew that their sales of gas rose from 983 million feet in 1898 to 1694 millions in 1909, and the meters in use in the same period from 51,929 to 93,457. In Greater Berlin, it was said that there were 618,000 gas-meters, and only 49,000 electric meters. This, in view of Germany being the most scientific nation of the world, was incontrovertible evidence in favour of gas. But if the "Age" was serious in its remarks as to gas being superseded, it was strangely inconsistent; for the proprietors had noted that it strongly condemned the City Council for their neglect in not having taken the gas-works over during the last decade.

They now came to the reiterated assertion that electricity as an illuminant was cheaper than gas. On this point, the Board were prepared to substantiate the comparison of cost they set out in a pamphlet recently issued by the Company. He would restate the comparison, so that there might be no mistake as to their position.

With gas-burners of the modern type, 1 cubic foot of gas can maintain 25-candle power for one hour. At 5s. per 1000 feet, the cost of this amount of light is 0·06d.—in vulgar fractions, one-sixteenth of a penny. A metallic filament electric lamp for every single candle power requires at least 1·3 electric watts per hour. To maintain 25-candle power for one hour requires 32·5 watts; and this at 4½d. per unit (1000 watts) would cost 0·146d. The cost of the same light, therefore, in electric current, is almost two-and-a-half times its cost in gas.

Much criticism had been directed to the claim made by the Secretary, that a cubic foot of gas could maintain 25-candle power for one hour. This, however, had been vouched for in the published correspondence of Mr. J. M'Connell, the Manager of the Welsbach Light Company of Australia, Limited, who was connected both with gas and electricity, and Mr. J. S. Weir, the Melbourne Manager of Messrs. Thomas Glover and Co., Limited, meter makers, and was well recognized by all acquainted with modern systems of artificial illumination. It would be noted from the extracts he had read, that it had been suggested that the Secretary, in his letter, based his calculation on some phenomenal kind of burner never heard of in Melbourne, and that every attempt had been made to throw doubt upon his statement. Inverted incandescent burners had long been upon the market, and were being sold daily in the show-rooms of the Gas Company and elsewhere, giving an efficiency of over 100-candle power for a consumption of 3½ cubic feet of gas per hour; burners of 50-candle power for a consumption of 2 cubic feet; and burners of 25-candle power for a consumption of 1 cubic foot. Their critic had evidently been too busy in posting himself in the wonderful possible results of the metallic filament electric lamp to become acquainted with the merits and efficiency of the modern inverted gas-burner; and these burners they were prepared to supply to any of the public who desired to have them. The Company's claim was that, light for light, candle-power for candle-power, gas at 5s. per 1000 cubic feet was more than 50 per cent. cheaper than electricity at present prices. A 60-candle power gas-lamp should not be pitted against a 16 or 25 candle power electric lamp; and when the lesser unit of light was adopted as a standard, the Company were in the same position as the electric undertakers, and could supply the necessary lamp to place the comparison upon equal terms. The "Age" in its attack on what it erroneously called a "monopoly" (inasmuch as this Company had not the sole right to supply light and heat in Melbourne and suburbs), seemed utterly regardless of the harm which would be done to wage-earners of the community if they succeeded in their efforts to materially damage it, as there was distributed among their 1400 employees, including meter-makers and stove workmen, £160,000 per annum in salaries and wages; and surely such action was inconsistent with their policy of befriending and helping local industries.

At times stress had been laid on their large dividends, and as his explanation on this matter made twelve months ago had been ignored, he was compelled to repeat himself by pointing out what was patent to everyone making even a casual examination of the balance-sheet.

The paid-up capital of the shareholders is	£857,210
The premium on the capital, paid in cash by the shareholders for their shares, is	466,535
Making a total amount of	£1,323,745

The amount per annum received in dividends by the shareholders was £85,721, or 6½ per cent. on the capital found by them, and this with a debenture debt nearly equal to the amount of the paid-up capital. As regards the Company's grasping nature, shareholders were receiving 10 per cent. on their paid-up capital, though under their Act they were entitled, should profits allow of it, to 19 per cent. with gas at its present price. This was surely sufficient answer to the reflection. In regard to unnecessary sinking funds that they were building up, this was a pure invention; for with the exception of a small sinking fund of £550 per annum, set aside to provide at the end of the lease the original cost of the offices, they had not one penny to the credit of a sinking fund. He could only regret the "Age" was not correct in this statement; for, in his opinion, the Company's competitors, the City Council, were wise in having one. As to hiding their profits away and despoiling the people in the most flagrant and barefaced manner, and piling up magnificent reserve funds, the proprietors would see, by turning to the balance-sheet, that, after payment of the dividend, they would have no cash in hand, that they had no investments outside the Company, and therefore that their reserve fund of £81,382 (a small one compared with their debenture and share capital of £2,121,745) must be all in the business. Referring to this large capital of £2,121,745, it would have been noted that the first extract quoted from the "Age" stated that "under this arrangement, the Company, whose capital is £857,000, could be forced to sell only at a price of £2,541,000," which was an utterly misleading statement as to the Company's capital, inasmuch as it left out of account the debentures and the premium capital, totalling £1,264,535. The Directors regretted that a newspaper of such standing should have gone out of its way to attack the Company. Seemingly, any company or person that stood in the way of electrical progress ought to be annihilated. Their Company proved an obstruction; and the battering ram had consequently been brought into play. This being the case, they must do their best to repel the attacks, however vigorous and persistent they might be, and to not only do this, but carry on an active campaign of their own. That the proprietors of the "Age" should differ with the Board in the policy which, with fuller and more accurate knowledge of the circumstances, the Directors deemed to be best in the management of the Company, was, of course, the prerogative of any newspaper; but they had difficulty in arriving at the underlying motive for this very determined effort to injure the interests and hamper the business of the Metropolitan Gas Company, by statements which were, as had already been clearly shown, untrue. Whether any harm was being done to the Company by this unfair treatment, they were not yet prepared to say. It had, however, been largely discounted by the general body of consumers, who recognized that they were doing all they could to serve them faithfully; and this was clearly proved by the fact that the Company had during the past half year made progress which he was about to place before the shareholders, and which would, he thought, be satisfactory to them.

Turning to the operations of the Company for the past half year, he said he did not propose to enter upon any lengthy comparison of the figures with previous corresponding periods. This they usually reserved for the end of each year, and, furthermore, on the present occasion the effect on the balance-sheet of the recent strike had been to very largely destroy the value of any comparison which might be instituted. He would, however, supply a few figures in order to advise them of the present satisfactory condition of affairs. The number of meters standing fixed at June 30, 1910, as compared with the same date last year, was—

	1910.		1909.		Increase.
Ordinary	80,298	..	75,313	..	4,985
Slots	16,788	..	13,406	..	3,382
Totals . . .	97,086	..	88,719	..	8,367

It would be seen that slot meters were being installed at about the same rate as previously; and as more cookers were being taken by these consumers, the average of their consumption was increasing. The total quantity of gas sold was 881,468,000 cubic feet—an increase of 7½ per cent. over the June half of 1909; but as no doubt during the strike period, when coal was dear, more use was made of gas-cookers, he did not wish to lay stress on this comparison. Gas-stoves continued in great demand. There had been an increase in the number in use since June, 1908, of 5299; and the staff were endeavouring to see that proprietors of the stoves were made familiar with the most economical method of using them. The Company did not wish to encourage extravagant consumption of gas in either lighting or cooking, trusting rather to the legitimate extension of their business with the greater number of satisfied clients. Owing to the very large increase of those using gas-stoves, they had, in addition to seven men who visited houses and kept stoves in good order, recently engaged the services of three specially qualified lady demonstrators, whose duty it was to visit the homes in which stoves were fixed—especially in the case of new users—and show householders how to get the best value for their money. This innovation had met with much appreciation, and would have the effect of still further popularizing cooking by gas. The Company had had an exceptionally heavy task during the six months in endeavouring to meet the demands for new mains and services in various districts included in the area of supply. Some 17,778 yards of new mains had been laid, at a total cost of £7167; and a large number of new services were put in, at a cost of £6641. They had still a large number of applications for extensions of mains; and these they were proceeding to deal with as opportunity offered. At several meetings, he had alluded to the necessity of the Company at an early date entering upon the construction of an additional retort-house to cope with the increasing output of gas. They had yet, however, to decide the particular system to adopt in extending the carbonizing plant; and to this point the Board were giving most careful consideration, so that when they did build the additional retort-house, they might be quite sure that they were adopting the best and most efficient plant that modern methods of gas manufacture could offer. In order to ensure that the Directors in arriving at a decision might be in possession of the latest information available, it had been deemed advisable that the Engineer (Mr. P. C. Holmes Hunt) should visit England and the Continent, and make himself personally acquainted with the work done by the vertical, horizontal, and chamber systems of carbonizing, which was being carried out by experts in the gas industry, with some of whom he was in direct consultation on the subject. Mr. Hunt was now in England on this mission; and they expected him to be with them again before the end of the year, with a full report to guide the Board in dealing with this important matter in the shareholders' best interests and with the fullest advantage to the Company.

The Hon. THOMAS LUXTON seconded the motion; and it was carried.

The dividend recommended was then declared; and the proceedings concluded with a vote of thanks to the Chairman, Directors, and staff.

Bridgwater Gas Company.—The net profit of the Company for the year ending June 30 amounted to £4409, to which has to be added the sum brought forward from the previous accounts and interest received from bankers, making a total of £5704. After payment of dividends of 10 per cent. for the year on the "A" stock, and 5 per cent. on the "B" and "C" stocks, there will, the report says, be a balance of £2454, out of which the Directors propose to carry £487 to the reserve fund and £250 to the insurance fund—leaving a credit of £1717 to the next accounts.

MANCHESTER GAS DEPARTMENT SALARIES.

Committee's Recommendations as to Increases Approved.

A Special Meeting of the Manchester City Council was held last Wednesday, when the recommendations of the various Committees as to advances of salaries to officials in their respective departments were considered. All the increases were approved; but in regard to some considerable discussion arose—the proceedings extending from 10.30 in the forenoon until 4 in the afternoon, with a short interval for lunch. At the outset, an amendment was proposed that all the recommendations be deferred for six weeks, until the Conditions of Service Committee had reported; but this was defeated by 51 votes to 45.

The following increases were among those put forward by the Gas Committee: Mr. J. G. Newbigging, M.Inst.C.E., the Chief Engineer, from £1100 to £1200. Mr. J. R. Hill, Manager at the Bradford Road Station, from £450 to £475; with a maximum of £500. Mr. F. P. Smith, Accountant, from £400 to £425; with a maximum of £500. Mr. G. W. Tooley, Manager at the Rochdale Road Station, from £375 to £400, with a maximum of £450. Mr. T. Williams, Chief Cashier, from £375 to £400, with a maximum of £500. Mr. F. J. Caldecott, Chief Rental Clerk, from £350 to £375, with a maximum of £400. There were also increases to other officials holding less responsible positions, the total for the department being £517.

Alderman Gibson (the Chairman of the Gas Committee) moved the adoption of the Gas Committee's list *en bloc;* but an amendment was moved and carried, that the recommendations of the Committee be taken separately. In the case of Mr. Newbigging, an amendment that the advance be £50 instead of £100 was defeated, and the Committee's recommendation was adopted. Alderman Gibson pointed out that, in connection with the new gasholder at the Bradford Road works, Mr. Newbigging had saved the department some hundreds of pounds on an expert; and this was the man they would insult by offering him an advance of £50. Alderman Bowes went further. He said he was sure that Mr. Newbigging would not accept an increase of £50, but that he would sooner leave the service of the Corporation, whom he had already saved thousands of pounds. Opposition was also offered to the advance recommended to Mr. Hill; but an amendment that the rise be to £462 10s., moved by Mr. Ross Clyne, found no seconder. The Committee's recommendation was then confirmed, as were all the others, with little or no serious opposition.

Alderman Gibson had earlier reminded the Council that the Gas Committee were the first to fix a maximum for their employees—about six years ago; and he went on to demonstrate that the question of salaries never affected the rates, as argued by some people. Indeed, the turnover of the trading committees in 1896 was £2,791,000, and the wages paid £241,986. Taking this with a turnover of £4,900,000 in 1908 and wages of £330,000, it would be found, he said, that the percentage of wages to turnover had changed from 7·4 to 3·6. It was his opinion that the two chief causes of the increases in the rates were the cost of education and the fact that they could not borrow money at the same rate of interest, &c., as thirty years ago.

DOVER GAS COMPANY.

Addressing the shareholders at the half-yearly meeting of the Dover Gas Company, the Chairman (Mr. Willsher Mannering) said that, although there had been a decrease of 1½ per cent. in the output of gas, he might congratulate the proprietors upon the successful financial result of the half-year's work. The accounts showed a balance in favour of the Company of £4823, to which was added £143 received for interest and rent, giving a total of £4966. After charging interest on loans, income-tax, placing £250 to the suspense account, and writing off a similar amount for depreciation of sundry stores, there was sufficient to pay the usual dividend and leave £313 to be added to the surplus profit balance of former years—carrying forward £5653 to the current half year. As compared with the corresponding half of 1909, the revenue from sales of gas showed a decrease of £247. On the other hand, meter and stove rentals were more by £14, and residuals also yielded more by £109; thus making a total reduced revenue of £123 only. A comparison of the other side showed a reduced expenditure on coal of £272. A smaller quantity by 92 tons was used; and the cost was less by 4½d. per ton. Other items made a decreased total expenditure of £674. The increased balance carried to profit and loss was £551. During the half year, there had been no expenditure on capital account. At the end of June, the number of ordinary consumers was 2558, against 2613 a year ago; and the number of automatic consumers was 3826, against 3682—bringing up the total number of consumers to 6384, against 6295. The number of cookers, trivets, and heaters on hire was 5117, against 5112. The immediate prospects might be regarded as very good. The Company had renewed their coal contracts on favourable terms. Since the commencement of the current half year, there had been an increased consumption; and with the greater employment of labour in the town and district, he thought they might reasonably hope the increase would be maintained. The Company had again received very able assistance from the officers and the whole of the staff. One and all, by their united efforts, had largely contributed to the continued success of the business.

The report was adopted, and a dividend for the half year was declared at the rate of 7½ per cent. per annum, less income-tax. A vote of thanks was accorded to the Directors and the staff; and the Chairman, the Secretary (Mr. E. C. Fielding), and the Resident Engineer (Mr. Raphael Herring) replied.

Catalogue No. 10 of Manzel's patent automatic force and sight-feed oil-pumps for cylinder lubrication is to hand from the British Manzel Oil-Pump Company, of Carlisle. The advantages claimed for this pump are concisely set forth; and there are numerous explanatory illustrations.

OTTOMAN GAS COMPANY, LIMITED.

A Sound Position.

The Ordinary General Meeting of this Company was held on Tuesday last, at the London Offices, No. 9, Queen Street Place, E.C.—Colonel JAMES LE GEYT DANIELL in the chair.

The SECRETARY (Mr. Thomas Guyatt) read the notice convening the meeting; and the report (noticed in the "JOURNAL" for the 6th inst., p. 671) and the statement of accounts were taken as read.

The CHAIRMAN, in moving the adoption of the report and accounts, remarked that he thought they were the best he ever remembered the Board having the good fortune to lay before the shareholders. The accounts compared most favourably with those of the corresponding period of the previous year; and sound as the position of the Company had been, in his memory (and he had been a Director for about seventeen years) it had never stood in as sound a position as it did that day. Reference was made at the meeting twelve months ago to the probable, or possible, effect on the Company of the change in the conditions of government in Turkey. He then said that he believed it would make little or no difference to them—at all events, it would have no prejudicial effect; and this opinion, he felt, was confirmed by the operations, and by what they had learnt, during the period now under review. Of course, in a revolution of this kind, when new men who had never previously been in office tried to take up the reins of the old ones, they naturally thought that everything their predecessors had done was wrong. But they had, so far as the Company were concerned, come to their reason. In the negotiations which had been going on (and which he would refer to again presently), they thought they could lay down all sorts of rules and laws at their pleasure; but they found, he supposed, that they could not. For the purpose of these negotiations, the Company could not have had a better man out there than their Engineer and Manager (Mr. John Gandon). The Directors knew how well he stood with the Turks, and how completely they trusted him, and it was only just that his services should be acknowledged. The Board themselves had had some anxiety; but they felt that on Mr. Gandon had devolved a great deal of trouble and worry. However, everything, so far as could be seen, was now practically settled. Referring to the accounts, there were a few items to which he might allude. Sundry creditors showed an increase of £1132. Sundry debtors had increased some £3000; and of this, public lighting was responsible for £2200, and gas consumers for £800. Stocks exhibited a rise of £1540, of which fittings were £668 more, meters £200 more, coke and tar £180 more, and new mains £400 more. In the period under review, coals cost some £317 less, in spite of the fact that 160 tons more were carbonized; the average price having been the very good one of 17s. 3½d. per ton, against 18s. 7½d. in the corresponding period of the previous year. While on this point, he might mention that the Directors had arranged their coal supply for the next two years—that was, up to July, 1912—on terms which compared very favourably with the present conditions. Therefore there would, on this head, be no anxiety for some little time to come. The make of gas per ton had been 10,837 cubic feet. Wages had risen somewhat. The number of public lamps had increased; and under the new contract it would be augmented still further. Rent, interest, office expenses, &c., were less, in consequence of the interest on the debentures having ceased, owing to their having been paid off. On the credit side, the increase in gas-rental was contributed entirely by the private consumers. In May last the Board completed an arrangement with the Municipality—this was one of the things he had had in mind when speaking of Mr. Gandon—for a new public lighting contract to commence next November, on advantageous conditions, involving an extension of the area, and also an increase in the number of lamps and the conversion of all the lamps that had not already been converted. In three months' time there would have been completed another decade in the history of the Company; and without wishing to anticipate the actual results, which they would then be able to calculate exactly, it would be found that in a matter on which the Board, well supported by their officers, had devoted much attention—namely, the cost of production—there had been a very material reduction, and that the number of consumers during the last ten years had been trebled. Therefore, he thought he was fairly justified in making the remarks that he had done as to the position of the Company.

Mr. STEPHENSON R. CLARKE seconded the motion; and it was at once carried unanimously.

On the proposition of the CHAIRMAN, seconded by Mr. H. WARD ANDREWS, dividends for the half year were declared at the rate of 7 per cent. per annum on the preference shares, less income-tax, and at the rate of 8 per cent. per annum on the ordinary shares, tax free.

The CHAIRMAN proposed a hearty vote of thanks to the Secretary, the Engineer, and the staff in Smyrna.

Mr. A. M. PADDON, in seconding, remarked that they would all have been able to infer from the Chairman's opening remarks that the duties of those in responsible charge of the Company's affairs in Smyrna were of an unusual character; and, of course, the difficulties and problems *in situ* must be always more acute than those which reached the Board in London. He would like to mention also their Consulting Engineer (Mr. A. F. Phillips). The Company were strong in every department of the executive, but they were peculiarly strong in having the guidance of Mr. Phillips.

The vote was heartily accorded; and Mr. GUYATT and Mr. PHILLIPS returned thanks.

The proceedings concluded with a vote of thanks to the Chairman and Directors, on the proposition of Mr. A. W. COOPER, seconded by Mr. W. H. DAUN.

Accident at the Heckmondwike Gas-Works.—While engaged one morning last week in fixing up some staging, two workmen at the Heckmondwike and Liversedge Gas-Works were thrown to the ground through the scaffolding giving way. One of them, George Harrison, sustained a broken ankle, and was removed to the Dewsbury Infirmary, but the other was fortunately uninjured.

HOLYHEAD WATER COMPANY AND THE COUNCIL.

At a Meeting of the Holyhead Urban District Council last Tuesday, considerable attention was given to the question of the water supply. At the outset of the proceedings,

The CLERK (Mr. T. R. Evans) read the following letter, which had been received by him from Messrs. Simpson, North, and Co., the Solicitors to the Water Company.

> We have been consulted by the Holyhead Water-Works Company with reference to the correspondence that has passed between you and them, and the statements from time to time publicly made by members of your Council impugning the quality of the water supplied to Holyhead.
>
> Our clients have recently expended considerable sums in executing additional works authorized by their Acts of Parliament, for the purpose of securing a good and efficient water supply, and have recently had samples of the water supplied sent to the Public Health Laboratories of the London Hospital Medical College, London, and there analyzed by Drs. Thresh and Beale, by whom our clients are advised that "the water is a good sample of moorland water, free from any excess of organic matter, and chemically showing no sign of pollution, and well adapted for all domestic purposes."
>
> Our clients have taken every precaution to ensure a proper supply, and they are satisfied that the water being supplied is pure and wholesome; and we strongly protest against the statements made in your letter of the 4th of August last, imputing neglect of duty on the part of our clients—statements which are devoid of foundation and productive of injury both to the Company and the town of Holyhead, and being made at a time when our clients are seeking additional capital for the development of their undertaking hinder rather than advance the future efficiency of the supply. We must ask your Council in the future to abstain from uttering statements damaging to our clients and their interests, and to give adequate publicity to the fact that the recent allegations as to the impurity of the water supply are unfounded.
>
> Our clients are fully aware of their duty and responsibility to the public; and whilst regretting the hasty and ill-considered action of your Council and the hostile attitude assumed by some of its members against the Company, our clients are nevertheless prepared to welcome your clients' co-operation in assuring to the public the continuance of a pure water supply, and invite a deputation of your Council to meet the Directors of the Company to endeavour if possible to devise a system by mutual arrangement between the Water Company and the Council for the analysis of samples of the water at intervals, with the object of preventing in future all misunderstandings regarding the purity of the supply.

Mr. HUMPHREYS said that the letter might mean anything. The Council were not supposed to take anything for granted. They should be supplied with a full report of the analysis of Dr. Thresh.

Mr. GORDON ROBERTS said he had a copy of a letter the Water Company had sent that day to the Valley Rural Council. It stated that, as the result of the allegations concerning the impurity of the Holyhead water supply recently circulated, the Company had instituted, under the authority of Drs. Thresh and Beale, a thorough examination of the whole system and surroundings of the supply. Extracts as follows from the reports of these gentlemen were enclosed; and the Company offered to supply any further information required.

> Report of sample of water taken from tap in yard at No. 43, Vulcan Street, July 23, 1910.—This water contains a little peaty matter in solution. Consequently there are many bacteria also present in it. These, however, are not excessive for a tap-water, and their number really has no significance whatever, since all objectionable bacteria are absent. In the quantities of water examined, the standard of purity, measured by the *B. Coli* standard, is very high. The water is excellent for all domestic purposes.

Mr. HUMPHREYS again urged that the Company should send them a full copy of the analysis.

Captain ROBERTS said he did not think it was their duty to ask for it a second time. The Company had refused once.

Several members, having taken exception to the terms of the Solicitors' letter,

The CLERK remarked that the letter he sent the Company was a very strong one. He threatened proceedings. The Company had found that they had made a mistake in refusing to meet a deputation from the Council; and they now asked the Council to appoint such a deputation. No reply had been received from the Local Government Board with reference to the copy of the analysis sent to them.

The MEDICAL OFFICER (Dr. Clay) expressed the opinion that there was still room for improvement in the filtration; but he said the last samples taken were not dangerous to health.

Eventually the Clerk was instructed to reply to the Company's Solicitors expressing the views of the Council, and pointing out that the filtration was not adequate.

Price of Gas at Shoebury.—The members of the Shoebury Urban District Council were informed by Mr. Bacon at their last meeting that the Gas Committee were of opinion that they were in a position to allow a reduction of 6d. per 1000 cubic feet from Oct. 1; but that the price of gas supplied to the water-works would remain unaltered. He moved a resolution to this effect, and added that the present reduction to large consumers would continue. Mr. Talmage thought that, with the proper working of the undertaking, gas could be taken into the house of every working man, and then show a profit at even a further reduction. Mr. Brooks said the water-works should get the same reduction as other consumers. Why should the works pay 3s. 6d. per 1000 cubic feet when private consumers paid only 3s.? Mr. Bacon remarked that he hoped the time was not far distant when the Council would be able to reduce the price of gas another 6d. The resolution was carried.

AMSTERDAM MUNICIPAL GAS-WORKS.

Report for the Year 1909.

From the report of the working of the Amsterdam Municipal Gas-Works (General Manager, Mr. J. van Rossum du Chattel), we extract the following particulars.

The two existing works of the Municipality—the Eastern and the Western Gas-Works—have been in operation most successfully; and it has now been decided to start at once with the erection of the third (the Southern) works.

The production of gas during the year 1909 was 87,497,100 cubic metres (3,090,098,000 cubic feet), of which 64,048,320 cubic metres (2,261,967,000 cubic feet), or 73·22 per cent., was coal gas, and 23,448,780 cubic metres (828,131,000 cubic feet), or 26·78 per cent., was oil and benzene carburetted water gas. The total amount of gas sold was 5·82 per cent. more than in 1908, and reached 87,462,500 cubic metres (3,088,876,000 cubic feet). The maximum daily delivery to consumers was 387,400 cubic metres (13,681,651 cubic feet); the minimum, 123,080 cubic metres (4,346,767 cubic feet).

To make these quantities of gas, 211,101 tons of gas coals (185,753 tons of Westphalian coals, 25,338 tons of English coals, and 10 tons of Australian cannel) were carbonized.

The length of the mains in the town was 248 English miles; the diameter varying from 47 inches to 4 inches; the capacity amounting to 819,875 cubic feet.

The number of meters in use on Dec. 31, 1909, was 104,198—viz., 44,330 ordinary meters and 59,868 prepayment meters. The average consumption of gas by prepayment meter was 17,660 cubic feet. The average consumption of gas per head, calculated over the entire population of the town, was 5139 cubic feet.

The average calorific power of the gas was 564 B.Th.U. per cubic foot gross, at 30 inches barometer and 60° Fahr. The average specific gravity was ·487.

The price of the gas was the same as in past years—viz., 3s. 3d. per 1000 cubic feet for ordinary meters and 3s. 6d. for prepayment meters.

The financial report shows that, for the year 1909, a gross profit of 3,470,608 florins (£289,217) was made, reduced by interest and redemption to a net profit of 1,850,523 florins (£154,210); whereas the net profit in 1908 was 1,362,572 florins (£113,548).

THE FATALITY ON THE MANCHESTER PIPE-LINE.

Coroner's Comments.

The adjourned inquest (see *ante*, p. 667) respecting the death by suffocation in a 44-inch water-main, near Caton, on Aug. 31, of Wiliam Micklethwaite, a labourer, was held last Wednesday, by the Lancaster Coroner, at Caton. Mr. W. F. Seymour, of Preston, represented the Board of Trade, and Mr. W. Tilly, jun., the deceased's mother. The deceased was at work varnishing the interior of a portion of the Manchester Corporation pipe-line from Thirlmere to Manchester, and was found suffocated, apparently by the varnish fumes, which temporarily overcame three other men who formed a rescue party.

Alfred Tomlinson, Clerk of the Works, said he received no instructions from his chiefs to see that the pipe was ventilated. Where the man died, there was no outlet for the varnish fumes. John Moffat, Contractor for the Corporation's third pipe-line, produced his specifications. The varnish used was, he stated, manufactured by Messrs. Anderson and Co., and was supplied in March or April, and tested by the Resident-Engineer. He did not know it was dangerous; and they had used a considerable quantity without any complaints from the men. Mr. Lionel Lutyens, Managing-Director of Messrs. Anderson and Sons, Limited, of London and Belfast, said they had manufactured "Siderosthen"—the varnish used—for fourteen years. The fumes given off in evaporation would be petroleum naphtha. Naphtha displaced oxygen in a confined space; and it was not safe to use the varnish in a tunnel 110 yards from ventilation. The man should have left his work when he felt the ill-effects of the fumes. The firm had decided to send out warnings with the casks. The Coroner remarked that they were not trying the varnish; and Mr. Lutyens' firm were not to blame.

Mr. Harry P. Hill, of the firm of Messrs. Hill and Sons, stated that he specified the use of "Siderosthen," which had been applied to 5000 pipe-joints without previous accident. He did not specify that it should be used in a confined space without ventilation, which should not have been done. There was no reason why the pipe-joints could not have been varnished before they were all coupled up. The Coroner: If you specify the use of dangerous materials, you should take precautions. Witness: I was not aware they were dangerous. The Coroner: I take it you knew there would be no ventilation in the place? Witness: No. There is ventilation now.

The Coroner, in summing up, said that it was evident the man died from lack of proper precautions for the ventilation of the pipe when he was at work with the varnish. It was admitted the varnish was not safe to be used in such a place. The Engineer who neglected to see to the ventilation of the pipe was the man to blame; and the neglect of an obvious duty became criminal, and meant a verdict of "Manslaughter." He did not, however, think the evidence justified this verdict, though it was not far away from it. If such a death occurred again, after the circumstances had been made public, there was not the slightest doubt a criminal charge must follow.

The Jury returned a verdict of "Death from misadventure," mentioning the lack of ventilation as being responsible for the fatality.

Messrs. Falk, Stadelmann, and Co., of Farringdon Road, forward a copy of their Gas-Fixtures Supplement No. 306, to be used with General Catalogue No. 296. It contains illustrations and particulars of a large number of gas lamps and fittings.

STARTLING FACTS AND FIGURES AS TO COALITE.

[From the "Daily Chronicle," Sept. 19.]

There have been many fiascoes in the City; but it is doubtful whether an instance can be found to beat the career of the British Coalite Company. We have received many inquiries from shareholders who have asked us to investigate the position. Who can be surprised at the irritation of the public who placed their money in what they regarded as a sound concern, backed by good names, when they find that all promises have been falsified, not a penny has been received in dividend, and the price of their shares has steadily dwindled and looks like approaching vanishing point? If the concern had been an alleged gold-mine or a reputed rubber plantation, the fact that it had passed more than three years in proving that it could do nothing much might not be particularly surprising; but when the prospectus was issued, the process was supposed to be a proved proposition. The only point that has been proved to date is the inability of the concern to pay even the most meagre dividend.

The Directors after three years of failure to justify the existence of the concern, from the point of view of dividend-yield—and this was the object of its promotion—take refuge in pleasantries. "To disappointed shareholders," said Sir William Preece at a recent meeting, "I would say that if anybody could explore the world and find Aladdin's lamp, the Chairman would only have to rub the lamp and say, 'Make me a coalite works at Barking that shall deliver 1000 tons of coalite a day,' and it would be done to-morrow. But there was no Aladdin's lamp for them." We do not know whether the shareholders were amused at this juvenile humour; but without going to the expense of co-opting Aladdin to the Board, they would undoubtedly feel more satisfied if some of the promises made in the prospectus had been fulfilled even without the aid of a lamp.

The prospectus was issued in June, 1907—the capital being £2,000,000; and an issue was made of 1,500,000 ordinary shares of £1 each at par. The proceeds of the issue were to be used for the completion of the purchase of freehold properties and for the construction of coalite works at Barking and elsewhere.

Prospectus Promises.

Nothing could be more definite than the statements in the prospectus—except their absence of fulfilment. It was set forth that the Company was formed to purchase patent rights for manufacturing and dealing in coalite; to acquire valuable freehold sites at Barking and Wednesfield, together with a coalite plant capable of an output of about 15,000 tons per annum "now in operation." It was also stated that the manufacture of coalite had been going on at Wednesfield "on a commercial scale," and estimated profits were set forth on the basis that 2,100,000 tons of coalite would produce with the resulting gas, apart from other bye-products of great value, a net profit of over £500,000.

This estimate the Directors observed did not take into account the profits to be derived from the sale of the bye-products, other than gas, or from the further manufacture of coalite in London and in the other large towns and districts throughout the kingdom. After paying 6 per cent. on the ordinary shares, a balance of £410,000 was apparent, in print, for further dividends and reserve. Not content with this, although the shareholders would be to-day, the Board further anticipated that the sale of the bye-products and the establishment of other coalite works in the Provinces would largely increase the profits.

On the arrangement entered into with Messrs. Cory and Son, Limited, concerning which a great fuss was made in the prospectus, we need not dilate. It was merely a matter of buying coal for the Company and selling coalite. Unfortunately, there does not appear to have been much chance to date of selling sufficient coalite to pay a dividend; and, more unfortunately still, considering the fact that his name undoubtedly attracted many people to the unfortunate venture, Sir Arthur Cory Wright has retired from the Board.

But taking the points set forth in the prospectus, how many who subscribed thought that they were buying something in its experimental stages? "A plant now in operation" and "the manufacture of coalite on a commercial scale has been going on during the past year" give the impression of a sound commercial concern, and not of three years' muddling through to nowhere in particular. Yet, after close on three years, the Chairman calmly observed that two years had been spent in developing the industry and correcting mistakes. What were the mistakes that had to be corrected when "the plant was in operation" and "the manufacture of coalite" was being conducted on "a commercial scale"?

Plenty of Smokeless Plants.

The vendors of the Coalite Limited took payment as to £55,000 in cash for payment of deposits and expenses, and £500,000 in deferred shares; and having regard to the fact that British Coalite has expended three years in tinkering about with the plant, the price was high enough in all conscience.

What did British Coalite buy? The right to make what any gas company in the kingdom can make if it chooses to.

The British Coalite Company put down its money for a name, and has spent the best part of its capital in improving plant supposed to be commercially working when the Company was formed.

Having paid a high price for the privilege of doing what any gas company could do, having bought land at fancy prices, still another indiscretion was committed, and the underwriting of the capital was undertaken by the parent concern, Coalite Limited. It was set forth in the prospectus that 750,000 shares had been underwritten, and as the public subscribed for only about 300,000 shares, Coalite Limited found itself saddled with the difference between that number and the 750,000 on which the Board went to allotment. As the subscribed capital of Coalite Limited was only a little over £50,000, the falseness of the position is obvious at the start. The parent Company became largely indebted to British Coalite for calls on shares; and last December the Chairman deplored the fact that a large amount of the called-up capital had not been received.

This was, of course, the debt of Coalite Limited, the parent Company, to its unfortunate child. Sir William Preece, with the sunny, smokeless optimism which has always characterized the British Coalite administration, observed that the Board was satisfied the remaining

GAS COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 767.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,474,000	Stk.	Apl 1	5	Alliance & Dublin Ord.	81–84	..	5 19 1
310,000	Stk.	July 14	4	Do. 4 p.c. Deb.	97–99	..	4 0 10
200,000	5	May 12	7	Bombay, Ltd.	6⅜–6⅝	+⅛	5 5 8
40,000	5	..	7	Do. New, £4 paid	5–5¼	+⅛	5 6 8
50,000	10	Aug. 31	15	Bourne- mouth Gas & Water	28½–29½	..	5 1 8
311,810	10	..	7		16–16¼	..	4 4 10
75,000	10	..	6		14⅞–15¼	..	3 18 8
380,000	Stk.	Aug. 12	12½	Brentford Consolidated	246–249	..	5 0 5
330,000	..	..	9½	Do. New	184–186	..	5 2 2
50,000	..	..	5	Do. 5 p.c. Pref.	—	..	—
206,250	..	June 10	4	Do. 4 p.c. Deb.	99–101	..	3 19 3
220,000	Stk.	Aug. 31	11	Brighton & Hove Orig.	214–217	..	5 1 5
246,320	..	..	8	Do. A Ord. Stk.	154–157	..	5 1 11
460,000	20	Apl. 1	10⅝	British	45–46	..	4 12 4
109,000	Stk.	Aug. 12	6	Bromley, A 5 p.c.	117–119	..	5 0 10
165,700	..	..	4½	Do. B 3½ p.c.	88–90	..	5 0 0
82,278	..	..	5½	Do. C 5 p.c.	106–108	..	5 1 10
55,000	..	June 29	3½	Do. 3½ p.c. Deb.	85–87	..	4 0 6
250,000	Stk.	..	4	Buenos Ayres 4 p.c. Deb.	97–99	..	4 0 10
100,000	10	—	—	Cape Town & Dis., Ltd.	3–4	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	5⅛–6⅛	..	—
50,000	50	May 3	6	Do. 6 p.c. 1st Mort.	49–50	..	6 0 0
100,000	Stk.	June 29	4½	Do. 4½ p.c. Deb. Stk.	88–90	..	5 0 0
157,150	Stk.	Aug. 12	5	Chester 5 p.c. Ord.	109½–111⅞	..	4 9 8
1,513,280	Stk.	..	5 5/16	Commercial 4 p.c. Stk.	105–108	..	4 16 3
560,000	..	..	5	Do. 3½ p.c. do.	101–103	..	4 17 1
475,000	..	June 29	3	Do. 3 p.c. Deb. Stk.	80–82	..	3 13 2
800 000	Stk.	June 10	5	Continental Union, Ltd.	98–100	..	5 0 0
200,000	..	..	7	Do. 7 p.c. Pref.	137–139	..	5 0 9
492,270	Stk.	—	5½	Derby Con. Stk.	122–124	..	4 8 9
55,000	..	—	4	Do. Deb. Stk.	104–105	..	3 16 2
148,995	..	Apl. 1	5	East Hull 5 p.c. Ord.	96–98	..	5 2 0
486,090	10	July 14	12	European, Ltd.	23¾–24	..	5 0 0
354,060	10	..	12	Do. £7 10s. paid.	17¾–18¼	..	4 18 8
16,179,445	Stk.	Aug. 12	4⅝	Gas light and Coke	4 p.c. Ord.	105–107	..	4 7 2
2,600,000	..	..	3⅜		3⅜ p.c. max.	87–89	..	3 18 8
4,062,235	..	..	4		4 p.c. Con. Pref.	103–105	+1	3 16 2
4,531,705	..	June 29	3		3 p.c. Con. Deb.	80–92	..	3 13 2
258,740	Stk.	Sept. 15	5	Hastings & St. L. 3½ p.c.		92–94*	+½	5 6 5
82,500	..	..	6½	Do. do. 5 p.c.		114–116*	..	5 12 1
70,000	10	Apl. 29	11	Hongkong & China, Ltd.		17–17½	..	6 5 9
131,070	Stk.	Sept. 15	5⅜	Ilford A and C		145–148*	+1⅜	4 19 8
65,780	..	..	5⅜	Do. B		112–114*	+1½	5 3 1
65,500	..	June 29	4	Do. 4 p.c. Deb.		98–100	..	4 0 0

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
4,940,000	Stk.	May 12	9†	Imperial Continental	186–188	..	4 15 9
1,235,000	Stk.	Aug 12	3½	Do. 3½ p.c. Deb. Red.	92–94	..	3 14 5
200,242	Stk.	Aug. 31	6	Lea Bridge Ord. 5 p.c.	119–121	..	4 19 2
561,000	Stk.	..	10	Liverpool United A.	218–220	+3	4 10 11
718,100	..	..	7	Do. B	161½–163½	..	4 5 8
306,083	..	June 29	4	Do. Deb. Stk.	104–106	..	3 15 6
75,000	5	June 29	6	Malta & Mediterranean	4 5/16–4 7/16	..	6 4 8
560,000	100	Apl. 1	5	Met. of 5 p.c. Deb	100–102	..	4 18 0
250,000	100	..	4½	Melbourne 4½ p.c. Deb.	101–103	..	4 7 5
541,920	20	May 27	3⅜	Monte Video, Ltd.	12½–13	..	5 7 8
1,775,892	Stk.	July 28	4⅝	Newc'tle & G'tesh'd Con	102–103	..	4 5 0
529,435	Stk.	June 29	3½	Do. 3½ p.c. Deb.	90–91	..	3 16 11
55,940	10	Aug. 31	7	North Middlesex 7 p.c.	13–13⅜	..	5 3 8
300,000	Stk.	Apl. 29	8	Oriental, Ltd.	138–140	..	5 14 4
60,000	5	Sept. 15	8	Ottoman, Ltd.	6–6⅛*	..	6 8 0
31,800	53	Aug. 31	13	Portsea Island A.	131–133	..	5 3 0
60,000	50	..	13	Do. B.	124–126	..	5 3 2
100,000	50	..	12	Do. C.	117–119	..	5 0 10
114,800	50	..	10	Do. D and E.	93–101	..	4 19 0
398,490	5	Apl. 29	7	Primitiva Ord.	7⅛–7⅜	..	4 13 4
796,980	5	June 29	5	Do. 5 p.c. Pref.	5⅛–5⅜	..	4 13 0
488,900	100	June 1	4	Do. 4 p.c. Deb.	97–99	..	4 0 10
312,650	Stk.	June 29	4	River Plate 4 p.c. Deb.	97–99	..	4 0 10
250,000	10	Apl. 1	9	San Paulo, Ltd.	15⅞–16⅛	..	5 10 9
62,500	10	..	6	Do. 6 p.c. Pref.	11⅞–12⅛	..	4 18 0
125,000	50	July 1	5	Do. 5 p.c. Deb.	51–52	..	4 16 2
135,000	Stk.	Aug. 31	10	Sheffield A	229–231	..	4 6 7
209,984	..	..	10	Do. B	229–231	..	4 6 7
523,500	..	..	10	Do. C	229–231	..	4 6 7
70,000	10	May 27	7	South African	11–11½	..	6 1 9
6,429,895	Stk.	Aug. 12	5/9/4	South Met., 4 p.c. Ord.	121–123	..	4 8 10
1,895,445	..	July 14	3	Do. 3 p.c. Deb.	79–81	..	3 14 1
209,820	Stk.	Aug. 31	8	South Shields Con. Stk.	153–154	..	5 3 11
605,000	Stk.	Aug. 12	5⅝	S'th Suburb'n Ord. 5 p.c.	120–122	..	4 12 9
60,000	..	..	5	Do. 5 p.c. Pref.	120–122	..	4 2 0
117,058	..	July 14	5	Do. 5 p.c. Deb. Stk.	121–123	..	4 1 4
502,310	Stk.	May 12	5	Southampton Ord.	110–112	..	4 9 3
120,000	Stk.	Aug. 12	7	Tottenham A 5 p.c.	140–142	..	4 18 7
483,940	..	..	5⅜	and B 3½ p.c.	111–113	..	4 17 4
149,470	..	June 29	4	Edmonton 4 p.c. Deb.	57–59	..	4 0 10
182,360	10	June 10	8	Tuscan, Ltd.	9–9½	..	8 8 6
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	97–99	..	5 1 0
236,476	Stk.	Aug. 31	5	Tynemouth, 5 p c max.	111–113	..	4 8 6
255,636	Stk.	Aug. 31	6⅜	Wands- B 3½ p.c.	136–138	..	4 17 10
85,766	..	June 29	3	worth 3p.c. Deb. Stk.	73–75	..	4 0 0

Prices marked * are "Ex div." † Next dividend will be at this rate.

outstanding amount due upon the shares would be "liquidated" early this year. What possible grounds he could have for this optimism it is impossible to say, unless he was speaking of a share arrangement which was entered into later, which certainly did not bring the solid cash to the British Coalite as must have been expected by those who heard that the debt would be liquidated.

"We have plenty of cash to complete our programme," said Sir William Preece in December, 1909; and yet in July last the Company was forced to make an issue of £300,000 first mortgage debentures. These were made through the Investment Registry; and whether they have been taken up fully or not, we cannot say. But this issue has been placed before the ordinary shareholders' dividend.

PEDDLING DEBENTURES.

The Investment Registry, it may be observed, is an outside stock-broking institution, which directs its attention largely to the purchase of blocks of bonds or debentures which it gradually disposes of to the public—naturally at a considerable profit to itself. The shareholders of British Coalite might well ask the Board why it elected to make an issue in this manner, and upon what terms these debentures were sold to the Investment Registry. If they were worth having, they were worth offering to the shareholders, who should have received the profit. What then was the object of going to an outside stockbroking firm? Moreover, did the Investment Registry put its money down for the debentures, or did it have a call upon the Company to hand over the debentures at the same rate as it could get rid of them?

The facts are that the Board blundered in going to allotment on insufficient capital subscribed by the public; blundered in paying a big price for a word; blundered in having shares underwritten by a parent Syndicate which could not carry out its obligations; and blundered yet again in the release of the parent Company from its debt by share transactions and an issue of first mortgage debentures in front of those who had subscribed for the ordinary shares.

The finance of the Company has been hopelessly muddled, as is evidenced by the prices of the shares. British Coalites stand at a nominal price of 6s. 6d., after having been 22s. at one time. It would be very difficult to sell many at the figure; and Coalite Limited, which at one time were quoted £44, are now £3 5s. So much for Coalite finance. We will deal in another article with the practical position and the hopeless conditions which prevail at the various works of the concern.

The Corporation of Birkenhead have placed an order with Messrs. Ed. Bennis and Co., Limited, of Little Hulton, Bolton, for the supply to their pumping-station of three sets of "Bennis" high-duty smokeless and gritless coking stokers and compressed air furnaces, for Lancashire boilers. Messrs. Brotherton and Co., Limited, of Leeds, have also given the firm an order for two sets of stokers and furnaces, for an 8 ft. 6 in. Lancashire boiler. The latter is a repeat order.

LOAN REPAYMENTS ON WATER UNDERTAKINGS AND ECONOMY IN SUPPLY.

In the course of his Presidential Address to the Engineering Section at the Royal Sanitary Institute Congress at Brighton, Mr. HENRY ROFE, M.Inst.C.E., referred in the following terms to the question of loan repayments on water undertakings and economy in supply.

All water-works authorized by Parliament have to be maintained out of revenue in accordance with the provisions of the Water-Works Clauses Act, 1847, which is now incorporated in all Special Water Acts. In the case of gravitation works, so far, at any rate, as impounding reservoirs are concerned, there is practically no depreciation. An earthen embankment fifty years old is probably a stronger structure than one ten years old. In pumping schemes, first-class machinery which was erected seventy or eighty years ago is running and in good condition. Large trunk mains are in existence and in good condition which have been in use for a much longer time than is now generally allowed for the period of repayment. Under these circumstances, it is permissible to doubt whether some of the severe restrictions with regard to repayment of loans now in force are really beneficial either to the consumer or to the ratepayer. They afford, however, a very strong reason for the exercise of the strictest economy in the distribution of the water; so that, if possible, a revenue may be earned sufficient to provide the necessary payments to the sinking fund and to avoid a rate-in-aid.

This question arose during the present session of Parliament in the case of a Bill promoted by an important water board which was formed in the year 1897, when the undertaking of a water company was transferred to four constituent authorities. In 1899, it became apparent that larger works were necessary if the water board were to perform their duties properly; and, accordingly, in that year the construction of an additional storage reservoir was commenced. This reservoir was estimated to cost £157,000; and the Local Government Board, having approved of the scheme, sanctioned the borrowing of this amount of capital, but granted only thirty years for the repayment of the loan.

The water board promoted a Bill to authorize the construction of additional water-works and to sanction sixty years as the period for the repayment of the loan for the works proposed to be authorized by the Bill, and also to sanction a like period for the repayment of the loan for the construction of the works already sanctioned by the Local Government Board. The water board had previously applied for an extension of the time for the repayment of the loan; but this was refused by the Local Government Board, who also opposed the application in Parliament. It was shown that, by reason of the board having to provide the sinking fund in such an abnormally short space of time as thirty years, a rate-in-aid was inevitable. The result was that

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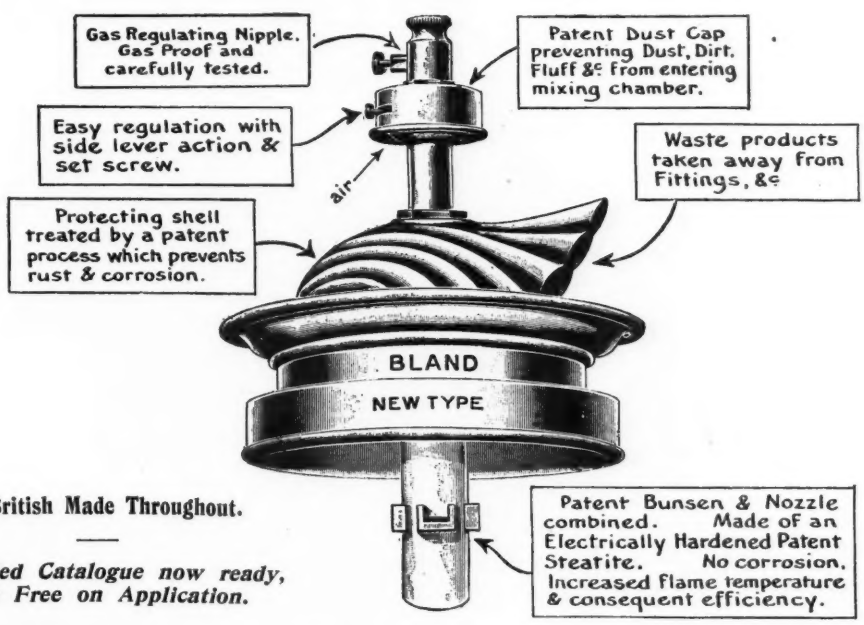
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the Committee granted fifty-five years for the repayment of the loan required for the works proposed under the Bill, but refused to interfere with the decision of the Local Government Board with regard to the period of repayment of the existing loan. They, however, expressed the opinion that, on the evidence before them, it was a case in which a more extended period might reasonably have been given by the Local Government Board, and that this was a case in which the Board might review their decision; and they invited the water board to appeal to the Local Government Board for reconsideration of their case. This was done, with the result that the Local Government Board extended the time for repayment to forty years. This, however, is still too short a period in such a case.

With the strictest economy, however, the water authorities must from time to time be faced with the necessity of providing additional supplies of water; and before this becomes urgent, care should be taken to ascertain, by observations extending over as long a period as possible, the rainfall of the district from which the supply is to be obtained, accompanied, in the case of surface supplies, by stream gaugings where possible, and, in the case of pumping schemes, the rest-level of the water in the area in which the well is to be sunk. All these are necessary before a scheme can be properly placed before Parliament for consideration; and generally their ascertainment is a hurried one, leading to possibly unnecessary opposition and expense. The information to be obtained from the British rainfall publications is useful. But, as a rule, it has to be supplemented at the last moment by special observations extending over a short period, whereas if water authorities would co-operate and arrange for rainfall observations to be carried out by, or in conjunction with, the Director of British Rainfall, they would, at comparatively small cost, be in possession of the information whenever required. The geological conditions should also be fully investigated.

Supplies of any magnitude from surface sources are becoming difficult to obtain, except at very great cost; and in many areas dependent upon underground sources, it is becoming difficult to obtain sites for wells, except at the risk of encroaching on existing public or private supplies. Possibly the ultimate solution of these difficulties may come through a combination of authorities, who will be able to afford to go to considerable distances if necessary in order to get supplies for their districts, and to obtain and undertake the preparation of the necessary information with regard to rainfall, geological conditions, and the ascertainment of the level of underground waters over large areas, in a manner that possibly no single authority could afford to do at the present time.

A number of twin-inverted gas-lamps have been fixed as an experiment at Southport; and the result is a great improvement in the gas lighting. "Moreover," says a local paper, "the new experiment being in such close contiguity to the arc lamps, affords an excellent comparison of the merits of gas and electricity for street lighting purposes."

STERILIZATION OF WATER.

In the course of a paper read before the Engineering Section of the Royal Sanitary Institute Congress at Brighton, Mr. H. C. H. Shenton said a great deal of information had come to hand during the past year with regard to the sterilization of water. There was some difference of opinion among chemists and bacteriologists as to the method of application of a sterilizing agent, especially in the case of hypochlorite of lime; and he urged the necessity of settling, once and for all, whether the sterilizing agent should be added before or after the organic matter has been filtered or settled from the water. He suggested that sterilization should be limited to the removal of harmful organisms; that the removal of organic matters should be effected by other means; and that in no way should sterilization be allowed to take the place of the preliminary processes. It was, however, clear, on the other hand, that if the preliminary processes were used for the physical and chemical purification of the water only, and did not have to deal with bacteria, they might be worked at an increased rate, and, consequently, their area or extent might be reduced. A sand filter, for instance, might deal with the organic matters in suspension satisfactorily, but might fail to remove the bacteria satisfactorily till a thick scum had formed on its surface, causing a very slow rate of filtration. The size of the filter had to be in proportion to the slow rate of the flow. There appeared to be excellent authority for saying that the proportion of chlorine required to remove harmful organisms from water was very small, provided that the water was free from organic matter.

It was clear that the chemist had not always taken into account the possibility of removing the organic matter before sterilization. At Baltimore, the water dealt with was more or less turbid, and had to be treated by coagulation and mechanical filtration; but the chemists appeared to have added the hypochlorite, not, as might have been expected, after filtration, but before filtration with the coagulant, and they found that, by adding the hypochlorite, a reduction in the quantity of coagulant required could be effected. Their conclusions were that hypochlorite of lime was more efficient when used with alum than when employed alone, that the high turbidity in the raw water reduced the bacterial efficiency of the hypochlorite of lime, but that the hypochlorite of lime, even when used in large quantities, caused but a slight reduction in organic matter. He suggested that alum could not increase the efficiency of the hypochlorite, and that the result described was due to the coagulation of the organic matter bringing about a condition favourable to the action of the hypochlorite, even before filtration, which condition would have been still further improved by filtration. It also appeared that the addition of hypochlorite without alum did not produce such a good result as with alum, for the reason that the hypochlorite would be used up in dealing with organic matter which, in the other case, was precipitated by the alum. But if the same quantity of alum had been added to the water before filtration, and the hypochlorite added after coagulation and filtration, as Dr. Rideal was doing a

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Shrewsbury, still better results might have been obtained. The settlement of the point as to the best condition of the water for receiving the sterilizing agent was much to be desired. If it was established that everything should be done which was practically possible to remove the organic matters from water before it was sterilized, the work of the engineer would be much clearer.

Mr. A. J. MARTIN (London) said he took it that the object of the author was to call attention to the divergencies between theory and practice. He held the opinion that when a sterilizing agent was used it should be kept to its own proper work—viz., that of dealing with organisms in the water—and should not be frittered away in oxidizing organic matter.

Mr. SHENTON said that possibly there might be some difficulty in putting the sterilizing agent into the water before it was filtered; for otherwise he could not conceive why various eminent American chemists, and possibly some English chemists, actually added the sterilizing agent to water containing a large amount of organic matter which could be easily excluded. He agreed with the speaker who said that water in a proper condition would not need to be sterilized; but his point was that in many places it was not in this condition. If it were, why was it that they were sterilizing at Shrewsbury, Lincoln, Cambridge, Paris, and in many places in America? And why was it that the London County Council were spending an enormous sum on storage reservoirs, which were not so absolutely certain in their action as sterilization would be? There were many places where the water was not above suspicion; and many chemists and bacteriologists were in favour of adding a very small proportion of chlorine in order to make it absolutely certain that no disease germs remained.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The gas industry is under deep obligation to the Corporation of Glasgow for having organized the exhibition which was opened in the city yesterday. It is not an exhibition of gas appliances only, as was at first intended; but the inclusion of electricity and other forms of smokeless fuel in the list of goods exhibited, so far from detracting from the position of gas in the public mind, has had the effect of enhancing that position. Any person approaching the subject with an open mind, which is what almost the whole of the visitors to the exhibition will do, will find it impossible to resist the conclusion, as they scan the benches, even cursorily, that on the gas side they are confronted with an array of articles every one of which bears testimony, in its outward appearance, to its work-a-day capabilities; whereas, on the electricity side, the conclusion must be equally irresistible—that what is shown them is still in the region of the wonderful mechanical toy. In other words, that gas is a power which is to be employed seriously, but that electricity is only an entertainment. Even in the matter of lighting, although, as a matter of fact, the nominal candle power of the lamps employed by the two systems is, in the aggregate, almost alike, there is no hesitation, in the minds of anyone, in asserting that the side upon which gas is used is by far the better lighted of the two. The object lesson which is given by the exhibition is the unmistakable one that gas as a fuel is, after coal, unapproachable. When the extent of the field which is open to the Corporation of Glasgow is taken into account, it will be apparent to most people that an exhibition so well planned and so admirably placed can have but one effect upon the fortunes of the gas industry, and that effect a favourable one. The exhibition is aimed at the domestic side of fuel consumption. Had it been considered advisable to appeal to manufacturers upon the question of fuel, the collection would have been very different, as other gases than coal gas would have had to be reckoned with; and had it been left open to both domestic and industrial fuel, the dimensions of the exhibition would have been unduly expanded, and the attention of visitors would have been inadvisedly dissipated. With the view restricted to the improvement of fuel for domestic purposes, visitors have a clearer vision of what is shown, and can sooner reach conclusions. The exhibition, which is to run three weeks, was auspiciously and happily opened by Lord Pentland. Perhaps it may be as well to state that the opening ceremony was attended, unofficially, of course, by a large number of gas managers, Scotch brethren of Mr. Alex. Wilson, the Gas Engineer to the Glasgow Corporation, who is President of the Institution of Gas Engineers; also, from England, by Mr. R. G. Shadbolt, of Grantham, the senior Vice-President of the Institution; and from Ireland by Mr. J. Brodie, of Lisburn. Already arrangements are being considered for the bringing of members of corporations to Glasgow to see the exhibition, which brings home quite forcibly that the Corporation of Glasgow have, by their timely action, laid many under obligation to them. Lest the word timely should be misconstrued, I may explain that the chief meaning it bears in the last sentence has reference to the circumstance that the Corporation of Glasgow have it now in their power to throw themselves without reserve into the work of promoting the demand for gas—a power which has hitherto been sadly crippled by Statute.

In the Valuation Appeal Court in Glasgow on Monday, a curious description of appeal was heard; the question involved being the charge for lighting common stairs. It is a practice in poor localities in Glasgow that owners are charged by the Corporation for the lighting of common stairs, and that the owners recover the amount from their tenants. The position of the Burgh Assessor was that anything over 10s. which the owners required their tenants to pay was of the nature of rent. There were appeals on the roll against the decision of the Assessor by 59 proprietors. It was stated for the appellants that the Corporation charge 14s. per lamp for electric lamps, and it was pleaded, as against the view of the Assessor, that whatever was charged over 10s. could not be regarded as being, within the meaning of the Act, consideration other than rent; also that electricity, in respect of which the money was paid, was not land or heritage. The Assessor pointed

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out that all that a proprietor was entitled by Statute to recover from his tenants was 10s. per lamp. If, therefore, the tenants paid more than 10s., they did so voluntarily; and the excess sum could not be regarded as a charge for stair lighting, but fell to be added to the rent. He understood that the argument against including the excess sum in the rent was that owners had agreed with the Corporation to light the common stairs with incandescent gas-burners or electricity. The Act of Parliament did not allow the owner to choose how the stair was to be lighted. The Corporation and their Inspector fixed the standard of lighting. If the stair ought to be lighted by either of the improved methods, the Corporation had power to compel an owner to so light it; but the Corporation had no power to compel an owner to pay more than 10s. per light. An owner had no right to agree to pay more than 10s. per lamp and then place such additional sum on the tenant. He had consulted the minutes of the Corporation. While the Corporation had met with owners, the minutes bore no trace that tenants had ever been consulted on the subject; and it seemed to him that the frequent letters to the Press sufficiently proved that the tenants were not aware that the maximum sum which an owner could compel them to pay for stair lights was 10s. The Court unanimously sustained the appeals; and Mr. Walker asked a case to be stated for the Superior Court.

Something of a rumpus occurred in the Dundee Valuation Appeal Court on Monday in connection with the valuation of the gas and electricity undertakings. In the case of the gas undertaking, the Burgh Assessor has fixed the valuation at £30,000; the Gas Engineer—Mr. A. Yuill—considers that the valuation should be £20,400; and the Parish Council suggest that it should be £31,500. The Assessor's valuation of the electricity undertaking is £18,000. The department consider it should be £12,733, and the Parish Council that it should be £19,500. In both cases appeals were taken by the Corporation. In the Court, the Assessor, Mr. G. C. Brown, protested against the manner in which the appeals had been forced upon him. The Assessor went on to explain that the trouble arose in the fixing of the sum to be allowed for tenants' plant. The Gas Commissioners declined to give him figures which he was entitled to until 14 days after the latest date at which he could make a valuation; then they sprang upon him three or four important points. His view was that the tactics were discreditable and dishonourable. Mr. A. Yuill, in explanation, said they had had to fight all along the line for their rights, and only got from the Assessor to the extent of their knowledge in the matter. The Gas Commissioners wanted no more than they were entitled to by Act of Parliament. They were quite prepared to go into the matter with the Assessor; but he invited them to appeal. It was agreed, in order to give time for adjustment of the subjects in dispute, to adjourn the hearing of the appeals for a fortnight.

The Arbroath Town Council had before them on Monday the public accounts for the year, presented by Mr. Thomson, the Convener of the Finance Committee. Dealing with the accounts of the Gas Department, he said the amount received for gas sold was £13,087, which was £699 less than the previous year, owing to the reduction in the price. For residual products they received £3422, which was £31 more. Radiator rents, which was a new item, amounted to £30; and interest, rents, &c., to £42. The total revenue was £16,581. The working expenses amounted to £11,597, which left a balance of £4984. To this they added £108; being the balance in hand at the beginning of the year, making a total of £5092. From this had been paid annuities, amounting to £1331; interest, £785; carried to sinking fund, £575; to contingency and depreciation account, £2000; to contingency for extraordinary damage, £100; and the statutory payment to the Arbroath Harbour Trust of £250—making a total of £5041, and leaving a balance on hand of £51. With regard to the sinking fund, during the year they had paid in redeeming annuities £284, they had repaid a loan of £250, and had a balance on hand of £51. Their capital bonded debt for the Gas Department was at the beginning of the year £20,295, and at the close £20,045. They would have £9 16s. less to pay in annuities after this. It was very good indeed to be able to pay off £534 in face of a reduction in price, and to keep the gas-works, if he might say so, not only abreast but ahead of every gas undertaking in Scotland. The Gas Convener and Gas Manager were entitled to their very best thanks for this splendid work. From the contingency fund they had paid for new condensers and the new gasholder £2000, and they had at the end of the year a balance of £700 available for extraordinary damages. The Council resolved, in view of a difference with the Surveyor of Taxes regarding the valuation of the gas-works for inland revenue purposes, to have the works re-valued by Mr. A. Gillespie, of Glasgow, who had previously valued them. The Surveyor of Taxes proposes to fix the valuation of the works at £5213, and the Gas Manager—Mr. A. C. Young—considers that it should not be more than about £4000. The Corporation are also at variance with the Burgh Assessor as to the valuation he has put upon the gas-works for local assessment purposes; and they have appealed—to themselves—against the valuation. The valuation of the Assessor is £4107, which is £214 more than that fixed a year ago, and £757 more than in 1908 9. Bailie Smith, the Convener of the Gas Committee, said that in a few years the valuation of the gas-works had been doubled; there was a mistake somewhere.

The Tayport Town Council about a year ago acquired the gas undertaking, and since then they have effected several improvements and alterations upon the works. On Saturday last, they inaugurated a new gasholder. At the opening ceremony, Mr. J. R. Strachan, the Convener of the Gas Commissioners, said that improvements had been carried out, not only as regarded the works, but in the supply. They had done away with meter-rents, and had reduced the price of gas by 5d. per 1000 cubic feet. A start had been made with the supplying of gas-cookers at a nominal charge; 100 being already in use. Mr. Bruce, the Manager, had turned the place outside in; and his work had culminated in the erection of the new gasholder. Mr. Strachan turned on the gas to the new holder. A silver rose bowl was presented by the Contractors—Messrs. Henry Balfour and Co., Limited, of Leven—to Mr. Strachan as a memento.

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CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Sept.* 17.

Sulphate of Ammonia.

Throughout the past week the market has shown great activity, the strength of the position having been accentuated by the presence of a considerable number of fresh orders; and the current production has been readily absorbed at prices continually tending in sellers' favour. The closing quotations are £12 11s. 3d. per ton f.o.b. Hull, £12 12s. 6d. per ton f.o.b. Liverpool, and £12 13s. 9d. per ton f.o.b. Leith. Although buyers refuse to pay a premium for future shipment, more interest has been displayed therein, and several transactions have been reported for delivery f.o.b. at the ports both for this year and the first half of 1911 at prompt values.

Nitrate of Soda.

The price of this article continues unchanged at 9s. 4½d. per cwt. for 95 per cent. quality and 9s. 7½d. for 96 per cent., holders maintaining a very firm attitude.

LONDON, *Sept.* 19.

Tar Products.

The markets for tar products have been steady throughout the past week. There has been little alteration in the market for pitch, and makers are still asking prices which are above those obtainable from buyers. Creosote is very dull, but there appears to be a general impression that prices will improve later on. Benzol, 90 per cent., is quiet, and there is some disposition on the Continent to purchase for delivery all over next year; but the prices are such as offer no inducement to makers. Benzol, 50-90 per cent., is quiet, and the Continent are offering equal to about 5⅜d. naked for delivery all over next year; but sellers will not accept this price. Toluol is steady without very much demand. Solvent naphtha is quiet, and orders are difficult to obtain. Heavy naphtha is also dull; and up to the present buyers do not appear anxious to cover their requirements for next year's delivery. Carbolic acid is quiet; and Continental consumers report purchasing at 1s. 0¼d. f.o.b. east coast ports. Naphthalene is steady; and creosote salts are in good demand. Tar is fetching fair figures.

The average values during the week were: Tar, 18s. 9d. to 22s. 9d. *ex* works. Pitch, London, 37s. 6d. to 38s.; east coast, 37s. 6d. to 38s.; west coast, 36s. to 37s. f.a.s. Mersey ports. Benzol, 90 per cent., casks included, London, 7d. to 7¼d.; North, 6¾d. to 7d.; 50-90 per cent., casks included, London, 7½d. to 7⅝d.; North, 7¼d. Toluol, casks included, London and North, 9d. to 9½d. Crude naphtha, in bulk, London, 3½d. to 4d.; North, 3½d. to 3¾d.; solvent naphtha, casks included, London, 1s. to 1s. 1d.; North, 11d. to 1s.; heavy naphtha, London, casks included, 11d. to 11½d.; North, 10¾d. to 11d. Creosote, in bulk, London, 2⅜d. to 2½d.; North, 2d. to 2¼d. Heavy oils, in bulk, 2¾d. to 2⅞d. Carbolic acid, 60 per cent., casks included, east coast, 1s. 0¼d.; west coast, 1s. Naphthalene, £4 10s. to £8 10s.; salts, 40s. to 42s. 6d., bags included. Anthracene, "A" quality, 1½d. per unit, packages included and delivered.

Sulphate of Ammonia.

The market for this article has been exceedingly firm during the past week. Prices have advanced all round; and it would appear that not only is Germany using more sulphate of ammonia than she can produce, but the make in England has fallen off in certain quarters owing to the rather larger production of water gas. The gas companies have advanced their price to £12 to £12 2s. 6d. Outside makes are selling on the 25½ per cent. basis at about £12. London f.a.s. is probably worth about £12 10s.; and this price has been declined in Hull. In Liverpool, £12 12s. 6d. has been paid; and in Leith, £12 15s.

A Trade correspondent writes: It is evident the higher prices of pitch have come to stay. There are no outside ports quoting less than 40s. per ton, and generally pitch is very firm indeed. Some large orders have been booked for solvent naphtha by merchants, who will have to cover these later on. Creosote and other products remain in about the same position. The average values are: Tar, 20s. to 26s. 6d. per ton. Creosote, 2d. to 2⅛d. per gallon, in bulk 2⅜d. per gallon, according to position. Pitch, 40s. 6d. per ton f.a.s Liverpool, 39s. 6d. per ton f.a.s. Manchester. Benzol, 50-90 per cent., 7¼d., casks free; benzol, 90 per cent., 7d. per gallon, casks free. Toluol, 9⅜d. per gallon, casks free. Solvent naphtha, 11½d. per gallon, naked; heavy naphtha, 10¾d. per gallon, casks free; crude naphtha, 3¾d. per gallon, naked. Light oil, 3⅜d. per gallon, naked. Carbolic acid, 60's, 1s. per gallon. Heavy oils, 3¼d. per gallon. Naphthalene salts, 50s. per ton.

COAL TRADE REPORTS.

Northern Coal Trade.

There is a steady, but not very pressing, demand for coal, and the supply is an adequate and ample one. In steam coals, there are rather fuller shipments, though those to the Baltic are falling off, as is usual at this season. Best Northumbrian steams are from 9s. 10½d. to 10s. per ton f.o.b., and second-class steams are 9s. For steam smalls, prices are a little easier—from 5s. 6d. to 6s. 9d. per ton f.o.b. being quoted. In the gas coal trade, there is a steady growth in the consumption, and shipments to the great gas companies are enlarging. Durham gas coals vary in price according to quality. The usual classes are from 9s. to 9s. 10d. per ton f.o.b.; and for "Wear" specials, up to 10s. 6d. is now the current quotation. There are sales of gas coals being made forward; but buyers wish for lower prices. Generally, about 16s. is still the price quoted at Genoa for good Durham gas coals delivered into or over next year, and lower prices are not readily taken; while the fact that current contracts now take up more of the

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output is stiffening prices. Coke is steady; but the larger production of gas coke makes the price a little weaker. Good gas coke is about 14s. to 14s. 3d. per ton f.o.b. in the Tyne or the Wear.

Scotch Coal Trade.

Trade remains quiet and far from satisfactory. It is with difficulty that the prices quoted are being obtained. These are: Ell, 8s. 9d. to 10s. 3d. per ton f.o.b. Glasgow; splint, 9s. 3d. to 9s. 6d.; and steam, 8s. 9d. to 9s. The shipments for the week amounted to 383,602 tons—an increase of 59,246 tons upon the preceding week, and of 61,879 tons upon the corresponding week of last year. For the year to date, the total shipments have been 11,238,223 tons—an increase of 823,346 tons.

Profit-Sharing with Management and Men.

Mr. Gilbert Little writes as follows: I have been on a business visit to Glasgow and district for a few days, in the towns on the upper and lower reaches of the Clyde, where the streets are crowded with the locked-out workmen; and a profit-sharing scheme that I outlined at Smethwick, after I got my first works there well established as a dividend-paying success, was recalled to my mind vividly, regretfully, and reproachfully. It is a moot point whether the non-adoption of the scheme more than six years ago is responsible or not for the fact that the dividend-paying business has never earned or paid a dividend since, or had any profits to share. I find the employers and the employed put forward many explanations to account for the general unrest prevailing at present, in the ranks of labour; and the constant warfare between Capital and Labour. Many causes suggest themselves to my mind; but the chief one appears to me, at present, to be the publication, during the last few months, of balance-sheets of limited liability companies showing astounding profits. The question arises, Cannot some practical scheme be evolved by the business brains of Britain to kill industrial strife, and obviate wealth-destroying warfare between Capital and Labour? In this connection, let me make one suggestion through the columns of the "JOURNAL"—viz., that after the shareholders of limited liability companies receive a fair dividend on their investment, the remaining profits be apportioned equally—one-third to labour, one-third to management, the remaining third to increase the dividend. My scheme has the merit of simplicity. After the payment of a fair wage to labour, and a fair dividend to capital, it is only "fair" that the management should participate equally in the surplus profits, which are as a rule largely due to management. In municipal works, the profits could be divided in equal thirds—among the men, the management, and the rates.

New Joint-Stock Companies.—The Leiston Gas Company, Limited, has been registered with a capital of £20,000 in £1 shares (700 preferred). The objects are to carry on the business of manufacturers, sellers, and suppliers of gas for light, heat, and motive power in Leiston, and elsewhere in Suffolk; also to acquire from Richard Garrett and Sons, Limited, the whole of the Leiston works gas plant, and from Eleanor M. Carr certain freehold land at Leiston. The Maikop Water-Works has been registered with a capital of £40,000 in £1 shares.

The Water-Slide Chandelier.—The evaporation of the water in a sliding chandelier is the cause assigned for an explosion which wrought serious damage to a house at Chesterfield, and so injured Mrs. Turner, the wife of the occupier, as to necessitate her removal to the hospital. The house had been empty while the tenants were on holiday; and when Mrs. Turner came back, she struck a match in the sitting-room without noticing that there was an escape of gas, which immediately led to the explosion. This is the second accident that has occurred in the immediate neighbourhood during the past three months in consequence of a leaking chandelier.

Sowerby Bridge Gas-Works Extensions.—At a special meeting of the Sowerby Bridge Urban District Council, the Clerk read a letter from the Local Government Board with regard to an application for sanction to borrow the sum of £15,900 for gas-works extensions—stating that it did not appear to the Board that the Council had sufficient margin of borrowing power available under their Local Acts. In view of the fact that further extensions would probably be required, it was resolved that the Clerk at once make application for, and take all necessary steps to obtain, a Provisional Order sanctioning the borrowing of the sum of £20,000 for the proposed scheme. Only one member voted against the motion.

Increased Dividends at High Wycombe.—The report submitted at the half-yearly meeting of the High Wycombe Gas Company stated that the sales of gas showed a steady increase when compared with the corresponding period of 1909. After paying interest on debentures, and providing £200 for the dividends on the preference shares, there remained a sum of £3068 available for dividend; and the Directors recommended that increased dividends should be paid—viz., at the rate of 10 per cent. per annum on the ordinary shares, and 7 per cent. per annum on the additional shares (less income-tax), and that a sum of £50 should be added to the reserve fund—leaving a balance amounting to £2101 to be carried forward.

A Challenge at Canterbury.—Noticing that the Canterbury Board of Guardians were contemplating the installation of the electric light in the workhouse and infirmary in substitution for the existing gas supply, Mr. James Burch, the Secretary to the Gas and Water Company, wrote suggesting a comparison of the two systems under the following conditions: The Gas Company to place an incandescent inverted gas-burner, together with a meter, examined and tested as correct by the London County Council, in the front window of the Company's show-room in St. George's Street. The Electric Light Committee to select one of the latest type metallic filament lamps, together with a meter certified as correct, by the side of the above. Both lamps to be of the same illuminating power, and connected so that both must be turned on at the same time, and allowed to burn for a period to be agreed upon. The result to be judged by an impartial person to be selected before the test takes place. It will be interesting to see whether the challenge is taken up.

ANCIENT & MODERN.

"Who's that, Sam?" inquired Mr. Pickwick.

"Why, I wouldn't ha' believed it, Sir," replied Mr. Weller with astonished eyes, "It's the old 'un."

"Old one," said Mr. Pickwick.

"What old one?"

"My father, Sir," replied Mr. Weller.

"How are you my ancient?"

THE spirit of the foregoing dialogue seems to permeate the gas-fire market at the present time; and, as is not uncommon, ideas that were in vogue years ago, come with a freshness to a generation whose recollection does not hark-back twenty years or so. A certain King once said: "There is no new thing under the sun. Is there anything whereof it may be said, See, this is new? It hath been already of old time, which was before us. There is no remembrance of former things."

So with gas-fires as with other matters, it is not the newness of the principle, but the clothing, as it were, of that principle in a dress, whose adornment and embellishment are more acceptable to the views of the present generation than to those of a past one. To take one instance only—that of single fuel. Many years ago, the late Mr. Thomas Fletcher, wrote:—

> "It is evident that the gas-fire (or whatever else it may be called) of the future cannot be a fire in the usual meaning of the term, **but must be a single surface at a high temperature,** if economy is any consideration."

The single fuel that we (Fletcher, Russell, & Co., Limited), are sending out this season may perhaps not be better than others, but it is quite as good; and although we have no "new" discoveries to report, we are able to offer this season, fires that are neat in appearance, economical in consumption of gas, satisfactory in working, cheap in price, and successful in modernizing the ideas of years ago.

TRY THEM.

See Advertisement, p. VI. centre of "JOURNAL."

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Heathfield Natural Gas.

Reverting to the subject of Heathfield Natural Gas in their issue of last Wednesday, the "Daily Mail" said: "'For many years,' writes Mr. Robert Howie, of Dargle, Cambridge Road, Southport, 'the natural gas at Heathfield has interested me; and when the Company came out, I put down ten pounds as my fee for a thorough geological report. What I should like to know is why there is not a sufficient number of people ready to do the same. There at Heathfield is the only natural gas outflow in England; and we do not know what material is in the retort from which the gas comes. I put my money down hoping for nothing but a thorough geological report. If more came of the investigations, well and good; if not, one of the most interesting geological points in England would have been settled. I cannot understand the apathy of the English geologists.' Like our correspondent, we do not even remember seeing any convincing expert report on the flow of natural gas undoubtedly existing at Heathfield. But many a ten pounds has been put down; and quite a sufficient number of people have been involved in the companies which have been exploiting the affair for years past. Probably because of the financing that has been going on, and nothing having yet come of it after all the years of promise, people have come to the conclusion that nothing is ever likely to come of it. There seems enough natural gas there to do a little work; but that is all. It is a natural conclusion that, with the gas flaring there for many years past, quite obvious to all experts, if there were any chance of developments, these would have occurred years ago. In the circumstances, we advise no one to put down another ten pounds."

Accident at the Huddersfield Gas-Works.—At the Huddersfield Gas-Works, about 8 o'clock on Monday morning of last week, when lifting the cover of a purifier, 40 feet long by 30 feet wide by 6 feet in depth, a momentary flame issued from it, and burnt seven of the men engaged upon the work. They went to the local infirmary, and received medical attention, but were not detained. It appears that the contents (oxide of iron) of the purifier had become heated. Immediately the cover was raised, and air entered the purifier, a flame issued round the edge; but no damage was done to the apparatus.

Automatic Lighting Experiment at Sheffield.—For the purpose of experimenting in automatic street lighting, the Sheffield Corporation have purchased a number of pressure-actuated lighters from Mr. B. Bonniksen. Of these 327 have already been fixed, and will represent a saving of £80 or £90 a year; and if the experiment is successful there will be a gradual extension of the system, until ultimately a saving of from £2000 to £3000 a year will be effected. There are in Sheffield nearly 10,000 street incandescent lamps controlled by the Watch Committee. It is not the intention of the Committee to discharge any of their employees in consequence of this saving. The number of lamps increases annually; and the men will be employed in other parts of the city to light and extinguish the lamps on which no automatic machines are fixed. There is also a gradual increase in lamp-cleaning work.

Alleged Nuisance at Oldham.—At a meeting of the Oldham Gas Committee, a letter was read from the Clerk to the Royton District Council again drawing the attention of the Committee to the nuisance alleged to arise from the Higginshaw Gas-Works. The writer said the Council would be pleased if they remedied the smoke nuisance; and he referred to the smell emanating from water which was discharged from the works. He suggested that the water should be treated before it was sent away. The Gas Engineer (Mr. T. Duxbury) said that he did not know of any gas-works where the smoke from the retort-houses was in any way prevented. The smell, he thought, was from a small quantity of water which ran down the stream from the new gasholders, and which smelt slightly of gas, though they had not had a single case of complaint from the Royton Dyeworks, who used the water from the stream for dyeing purposes.

Lewes Gas Company.—The report adopted at the meeting of the Lewes Gas Company stated that the revenue account for the half year to June 30 showed a profit of £2131. After providing for interest on mortgages, the balance of net revenue as seen by the profit and loss account was £5478. Dividends were recommended for the six months at the rate of 5 per cent. upon the original capital stock and 3½ per cent. upon the additional capital stock. The Chairman (Mr. M. S. Blaker) said it was one of the most satisfactory reports that had ever been presented to the shareholders. The receipts for gas during the half year were not quite so large as those during the corresponding six months of last year; but this was accounted for in considerable measure by the fact that during a part of the half year in 1909 the price charged for gas was 3s. 10d. per 1000 cubic feet, while during the past six months the price was only 3s. 8d. He thought the mantle of efficiency which characterized their late Manager (Mr. Levi Monk) had fallen on, and adapted itself to, the shoulders of his successor (Mr. E. Jones), whose management would bear comparison with the best traditions of the Company in respect of the expenditure side of the account.

Birmingham Gas-Burner Census.—It seems that a census is now being taken by the Birmingham Gas Committee in regard to the number of burners in use; and information as to its object has been sought by the local "Mail." In the course of an interview, Mr. R. S. Hilton, the Secretary to the Department, explained that he had asked the gas inspectors to ascertain, if they could, the number of burners in use in manufactories and private houses, and also the number of incandescent lights and of old-fashioned burners. The object was merely to see what field there was for improving the quality of the light in so far as the burner was concerned. The desire of the department was to educate persons in the use of the incandescent light, because it was more profitable in that a better light was given at less cost than with the old-fashioned burner. So far, the census showed that the vast majority of private residents used the incandescent burner. The result of the census might also suggest the desirability of making some slight changes in the manufacturing process of gas; and thus it was to the benefit of the public that the department should have the information asked for. The desire of the Committee was simply to ensure satisfaction on the part of those who used the gas.

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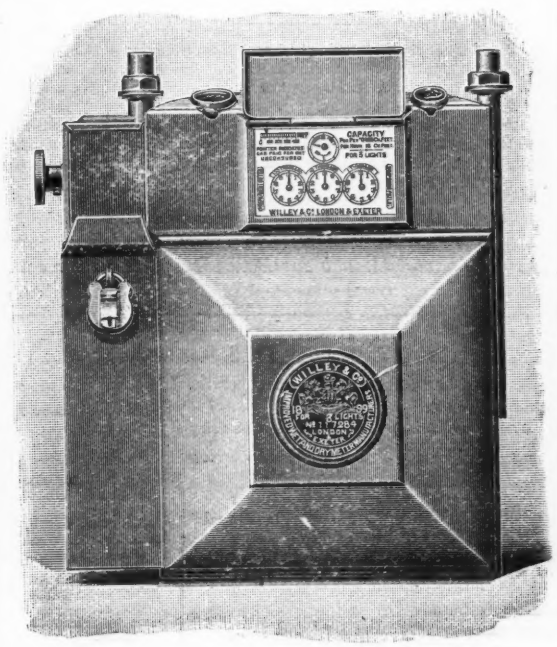

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Mr. William Severs, the Manager to the Wilmslow Gas Company, is a candidate for a seat on the Wilmslow Council—a vacancy having been created by the death of the member for the Dean Row district. His opponents, Messrs. Bilborough and Booth, are both engineers.

The Mansfield Town Council have resolved to make a further contribution of £300 from the profits of the gas undertaking towards the general district rate. It was reported that the question of a reduction in the price of gas is to be considered at the next meeting of the Committee.

A correspondent writes: "I should be much obliged if any of your readers could inform me if my Directors are legally entitled, in the absence of powers granted to the Company in their Special Act, to provide a small gratuity to an old servant of the Company on his retirement owing to ill-health."

The mains of the Burton Corporation gas undertaking are to be extended to the parish of Stretton, at a cost of £450. As the result of an informal canvass, one-third of the inhabitants have agreed to take gas; and the Gas Committee therefore believe that in time Stretton will prove a useful addition to the output of the Burton works.

Messrs. John Wright and Co., of Birmingham, are issuing their new booklets for the coming season. The printing is in two colours, and their excellent "get up" gives them the attractive look which is so well calculated to induce careful perusal. The title of the first, which has a coloured wrapper depicting ease and comfort, is "Wright's Eureka Gas-Fires;" while the other two deal respectively with "Gas Heating for Garage or Greenhouse," and "Warmth at Will" by means of gas-heated radiators.

The British Consul for Westphalia and the Rhenish Provinces writes, in his annual report, that, as regards gas-pipes, sales in the home and foreign markets improved, though most of the factories were unable to work full time throughout the year. The Gas-Pipe Syndicate were forced to reduce their prices. The home market, being protected, was fairly satisfactory; but exports were not remunerative, in consequence of foreign competition. Many foreign contracts were signed at low prices, simply to keep the works occupied, though profits were very small indeed.

In order to meet the water requirements at the Royal Naval College at Osborne, the Newport (Isle of Wight) Town Council last Wednesday assented to an expenditure of £900 for providing larger mains to the boundary of the borough, though fears were expressed that the naval and military authorities were on the *qui vive* to secure their own independent supply. For providing the necessary pipes, a tender of £585 was accepted from Messrs. J. Oakes and Co., of London; and for the carting and the laying of the pipes, an offer of £288 was accepted from Messrs. Smith and Whitehead.

A sensation was caused at the Central Station, Liverpool, last Wednesday evening, by the fusing of part of the electrical equipment of the Mersey Railway. About 8 o'clock, just as a train was entering the station, one of the short-length cables which conduct the electric energy from the main cables traversing the side of the tunnel to the rails fused, and quickly burning through caused an interruption of the current, and plunged the station in darkness. All intending passengers were excluded from the station, which for nearly an hour-and-a-half was closed for traffic purposes.

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Applications, accompanied by Four Testimonials, may be lodged with Messrs. J. & R. A. GRIERSON, Town Clerks, on or before the 26th of September current.

GAS-STOVE Manufacturing Company requires a GENERAL MANAGER possessing good Commercial Experience, and Technical Knowledge. Salary offered £400 per annum with Commission.
Applications, stating Age, and full Particulars of Qualifications, should be addressed to No. 5284, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED by a Firm of Ironfounders and Chemical Engineers, with Established Trade among Chemical Manufacturers, to undertake the Sole Rights of Making and Selling Chemical Specialities in Great Britain.
Apply No. 5262, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

DRAUGHTSMAN Wanted in a Gas Engineer's and Contractor's Office. Must be Accurate and Reliable, also Competent to Design and Take Out Quantities for Coal-Gas Plant generally.
Apply, by letter, stating Age, Experience, and Salary required, to No. 5289, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, an Assistant-Manager for the Matlock and District Gas Company, Aged 21 to 25. State Age, Qualifications, and Salary required. *Copies* of Testimonials must be furnished.
Applications, endorsed "Assistant-Manager," to
THE SECRETARY.
Gas-Works, Matlock,
Sept. 17, 1910.

WANTED, by the Leyburn Mutual Gaslight and Coke Company, a Practical GAS MAKER and FITTER, able to Take Meters if necessary and Capable of Managing Small Works. Annual make, Two to Three Million Cubic Feet. House, Coal, and Light found. Must be a Steady Man. Testimonials wanted from previous situation.
Applications, stating Age, Experience, and Wages required, to the SECRETARY, Leyburn, YORKSHIRE.

WANTED, at once, for a Foreign Appointment, a thoroughly Well Qualified GAS ENGINEER, about 28 to 35 years of Age. Salary offered, £350 per Annum, with a further sum to be agreed upon for each Works erected or extended. The Gentleman selected must be fully Qualified to Advise as to the Capacity, Design, and Cost of every part of a Modern Gas Plant, and Capable of Superintending, first the Erection and subsequently the Working of the Plant. In the first instance it is not necessary to send any Testimonials; these will be asked for later from Applicants whose Experience seems to render their Appointment suitable. Term of Appointment, Three to Five Years.
Applications to be addressed to No. 1047, SELL'S ADVERTISING OFFICES, Fleet Street, LONDON.

WANTED, Two Second-Hand Purifiers, 10-feet or 12-feet diameter.
Offers to the SECRETARY, Gaslight and Coke Company, Limited, Woodbridge, SUFFOLK.

FOR SALE—30,000 Cubic Feet an Hour EXHAUSTER. Good as New. Done very little work. Maker, Bryan Donkin and Co.
Can be seen on Application to THOS. DUXBURY AND Co., 16, Deansgate, MANCHESTER.

TAR FOR SALE—About Two Tons of GAS PRODUCER TAR per week, containing on an average 20 per cent. of water. Price wanted free on rail Bournville Works in Purchaser's own tank.
CADBURY BROS., LIMITED, Bournville, near BIRMINGHAM.

GASHOLDERS—16 ft., 24 ft., 26 ft., and 45 ft. Diameter GASHOLDERS, Cheap for immediate Sale. Re-erected in either Brick or New Steel Tanks Complete to Plan and Specification. Can be seen Temporarily Erected at our Works.
FIRTH BLAKELEYS, Thornhill, DEWSBURY.

SALE OF STREET LAMPS, &c., BY PRIVATE TREATY.

THE Carmarthen Town Council have for DISPOSAL about 230 STREET GAS LAMPS, COLUMNS, and BRACKETS, and a Number of INCANDESCENT BURNERS. Offers are invited for the whole or part. All Particulars can be obtained at the Borough Surveyor's Office, John Street.
Tenders, marked "Tenders for Lamp Posts, &c.," to be sent to the undersigned not later than the 15th of October, 1910.
The highest or any Tender not necessarily accepted.
JAMES JOHN,
Town Clerk.
Town Clerk's Office, Carmarthen,
Aug. 18, 1910.

MARKET HARBOROUGH URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

SURPLUS TAR AND SULPHURIC ACID.

TENDERS are invited for the Surplus TAR Produced and SULPHURIC ACID required during the Year ending Sept. 30, 1911.
Particulars may be obtained from the undersigned, to whom sealed Tenders, endorsed "Tender for Tar" and "Tender for Sulphuric Acid" respectively, must be delivered not later than Noon on Monday, the 26th inst.
ALFRED T. HARRIS,
Manager and Secretary.
Gas Offices, Market Harborough,
Sept. 12, 1910.

THE GASLIGHT COMPANY OF SLIGO.

TENDERS are invited for the Supply of 3000 to 4000 Tons of Best Screened GAS COAL, to be delivered in Cargoes of 500 to 600 Tons as required free on Quay at Sligo.
Tenders to be sent in not later than the 26th of September, 1910.
By order,
R. BROWN.
Secretary.
Sligo, Sept. 13, 1910.

COUNTY BOROUGH OF BLACKPOOL.
(GAS DEPARTMENT.)

THE Gas Committee are prepared to receive TENDERS for the Surplus TAR produced during the next Twelve Months from Oct. 1, 1910, to Sept. 30, 1911.
Particulars may be had from the undersigned.
Tenders, endorsed, to be sent, addressed to the Chairman, before Monday, Sept. 26, 1910.
By order,
JOHN CHEW,
Engineer and Manager.
Gas Offices, Princess Street,
Blackpool.

CLACTON URBAN DISTRICT COUNCIL.

THE above Council are prepared to receive TENDERS for the Supply and Delivery of about 50 Tons of BRITISH CAST-IRON PIPES and CONNECTIONS.
Copy of Specification and Form of Tender may be obtained from the Council's Engineer, Mr. Sydney Francis A.M.I.M.E., Town Hall, Clacton-on-Sea.
Sealed Tenders, endorsed "Tender for Pipes," to be delivered to the undersigned not later than Noon on Wednesday, the 5th of October, 1910.
The Council do not bind themselves to accept the lowest or any Tender.
GEO T. LEWIS,
Clerk to the Council.
Town Hall Buildings,
Clacton-on-Sea, Sept. 12, 1910.

CORPORATION OF LEICESTER.
(GAS AND ELECTRIC LIGHTING DEPARTMENT.)

SULPHURIC ACID.

THE Gas and Electric Lighting Committee of the above Corporation are prepared to receive TENDERS for the Supply of SULPHURIC ACID, made from either native Sicilian Brimstone, recovered Sulphur, or Pyrites. Specific Gravity in each case to be stated. The Price to include Free Delivery by Rail into Elevated Tanks, 27 feet high, at the Chemical Works, Aylestone Road.
Probable Quantity, about 2000 Tons, to be delivered during the ensuing Twelve Months.
Tenders, addressed to Mr. Alderman T. Smith, J.P., Chairman, and endorsed "Tender for Sulphuric Acid," to be delivered at these Offices not later than Eleven o'clock a.m., on Saturday, Sept. 24, 1910.
The Committee do not bind themselves to accept the lowest or any Tender.
WORTLEY S. LOVELL,
Chief Clerk.
Gas Offices, Millstone Lane,
Leicester, Sept. 14, 1910.

THE Proprietor of the Patent No. 19,479 of 1905, for "Improvements in or relating to Meters," is desirous of entering into Arrangements by way of License and otherwise, on Reasonable Terms, for the purpose of Exploiting the same and ensuring its Full Development and Practical Working in this Country. All Communications should be addressed in the first instance to HASELTINE, LAKE, AND CO., Chartered Patent Agents and Consulting Engineers, 7 & 8, Southampton Buildings, Chancery Lane, LONDON, W.C.

SALES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MESSRS. A. & W. RICHARDS beg to notify that their SALES BY AUCTION of NEW CAPITAL ISSUED UNDER PARLIAMENTARY POWERS, and of STOCKS and SHARES belonging to EXECUTORS and other PRIVATE OWNERS in LONDON, SUBURBAN, and PROVINCIAL GAS and WATER COMPANIES, take place PERIODICALLY at the Mart, TOKENHOUSE YARD, E.C.
Terms for Issuing New Capital, and also for including other Gas and Water Stocks and Shares in these Periodical Sales, will be forwarded on Application to MESSRS. A. & W. RICHARDS, at 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
HARROW AND STANMORE GAS COMPANY.

NEW ISSUE OF £00 £10 "C" SHARES.

MESSRS. A. & W. RICHARDS will SELL THE ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, Oct. 11, at Two o'clock, in Lots.
Particulars of the AUCTIONEERS, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
ALDERSHOT GAS, WATER, AND DISTRICT LIGHTING COMPANY.

NEW ISSUE OF £3500 "C" CONSOLIDATED STOCK,
AND
£3500 FOUR PER CENT. CONSOLIDATED PREFERENCE STOCK.

MESSRS. A. & W. RICHARDS will SELL THE ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, Oct. 11, at Two o'clock, in Lots.
Particulars of the AUCTIONEERS, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
BARNET DISTRICT GAS AND WATER COMPANY.

NEW ISSUE OF £10,000 "D" CAPITAL WATER STOCK.

MESSRS. A. & W. RICHARDS will SELL THE ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, Oct. 11, at Two o'clock, in Lots.

Particulars of the AUCTIONEERS, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the
GREAT YARMOUTH WATER-WORKS COMPANY.

NEW ISSUE OF £4000 NEW ORDINARY STOCK,
AND
£1000 FOUR PER CENT. PERPETUAL DEBENTURE STOCK.

MESSRS. A. & W. RICHARDS will SELL THE ABOVE BY AUCTION, at the Mart, E.C., on Tuesday, Oct. 11, at Two o'clock, in Lots.

Particulars of the AUCTIONEERS, 18, FINSBURY CIRCUS, E.C.

BRISTOL WATER-WORKS COMPANY.

SALE OF ORDINARY STOCK.

MESSRS. JOHN E. PRITCHARD & CO., late Alexander, Daniel, and Co., will SELL BY AUCTION, at the Bank Auction Mart, Colston Avenue, Bristol, on Thursday, the 6th of October, 1910, at Three o'clock in the Afternoon,

£15,000

BRISTOL WATER-WORKS SEVEN PER CENT. MAXIMUM CONSOLIDATED ORDINARY STOCK, in Lots of £100, at the reserved price of £136 for every £100 Stock.

The above £15,000 Stock is part of the Seven per cent. Maximum Consolidated Ordinary Stock, amounting to £970,000, created under the powers of the Bristol Water-Works Acts, 1888, 1889, 1895, and 1902.

The Dividend is subject to proportionate diminution whenever the maximum dividend to which each class of Ordinary Shares or Ordinary Stock of the Company is entitled shall not be paid in full, but such diminution may be made up in subsequent years.

For further Particulars and Conditions of Sale, Apply to the AUCTIONEERS, Bank Buildings, Colston Avenue, BRISTOL; to Messrs. EDWARD GERRISH, HARRIS, AND COMPANY, Lloyds Bank Buildings, Corn Street, BRISTOL; or to

ALFRED J. ALEXANDER,
Secretary and General Manager.
Bristol Water-Works Office,
Telephone Avenue, Bristol.

THOMAS DUXBURY & CO.,
16, DEANSGATE, MANCHESTER,
Best Gas Coal and Cannel, giving High Illuminating Power, Large Yield per ton, and reasonable in Price.
Telegrams: "DARWINIAN, MANCHESTER." Telephone 1806.

COOKE, ENNEVER & TULK,
Stock Brokers,
17 & 18, NEWGATE STREET, E.C., and PRINCE'S CHAMBERS, BIRMINGHAM.

We are Buyers and Sellers by Private Treaty of Stocks, Shares, and Debentures in approved Old Established Water or Gas Undertakings, and make this a speciality. Prices quoted on Application.

New Capital issued, Municipal Loans arranged.
COOKE, ENNEVER & TULK,
'Phone City 4660. Tele.: "BIPUNCTUAL LONDON."

'BUFFALO' INJECTOR

SEND FOR LIST.
Telegrams: "Temperature London." Tel. No. 12,455 Central.
GREEN & BOULDING, — LIMITED, —
28, New Bridge St., LONDON, E.C.

JAMES OAKES & CO.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road, CITY ROAD, LONDON, N.
Manufacture and keep in Stock at their Works (also large Stock in London)
PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS, and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.
NOTE.—Makers of HORSLEY SYPHONS. These are cast in one piece, without Chaplets; doing away with Bolts, Nuts, and Covers, and rendering Leakage impossible.

JOHN HALL & CO. OF STOURBRIDGE,
LIMITED,
STOURBRIDGE,
Manufacturers of
FIRE-BRICKS, LUMPS, TILES,
GAS RETORTS,
And every description of Fire-Clay Goods.
RETORTS CAREFULLY PACKED FOR SHIPMENT.

HEATHCOTE GAS COAL
from the
GRASSMOOR COLLIERIES,
CHESTERFIELD.
Rich in Illuminating Power and Yield of Gas.
Above the Average in Weight and Quality of Coke.
Maintains a High Standard in Residuals.

THOMAS TURTON AND SONS, LIMITED,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES,
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ANVILS, VICES,
AND ENGINEERS' TOOLS GENERALLY.
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THE
EARLIEST WORKS ON GAS LIGHTING.
A List of Books, Pamphlets, and Important References prior to the Year 1840.
By F. SOUTHWELL CRIPPS, Assoc.M.Inst.C.E.

London: WALTER KING, 11, Bolt Court, Fleet Street, E.C.

GAS COAL AND CANNEL.
WILSON CARTER & PEARSON,
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Gas, Steam, and other Fuel for Home and Export.
GAS COKE CONTRACTORS.
Chief Offices: **50, NEW STREET, BIRMINGHAM.**
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"TO BE FOREWARNED IS TO BE FOREARMED."
Vide "JOURNAL OF GAS LIGHTING," &c., Aug. 30, 1910.
Have YOU taken the "bull by the horns" and obtained a sample **"Parkinson" Angle Inverted Burner** Set fitted in the **"Parkinson" Windproof Lamp?**
GAS AND AIR ADJUSTERS OPERATED OUTSIDE THE LAMP.
NO DANGER OF MANTLES BREAKING BY WIND, &c.
SOLID CAST BRASS BURNER. "ADAMAS" INCORRODIBLE NOZZLE.

PARKINSON and W. & B. COWAN, LTD.,
Street Lighting Specialists,
BELL BARN ROAD, BIRMINGHAM.
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NEWBATTLE CANNEL.
Highest Results in Gas, & Excellent Coke.
QUOTATIONS ON APPLICATION TO
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Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.
Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.
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MIRFIELD GAS COAL.
UNEQUALLED.
Sperm Value 878·85 lbs. per Ton.
Please apply for Price, Analyses, and Report, to the
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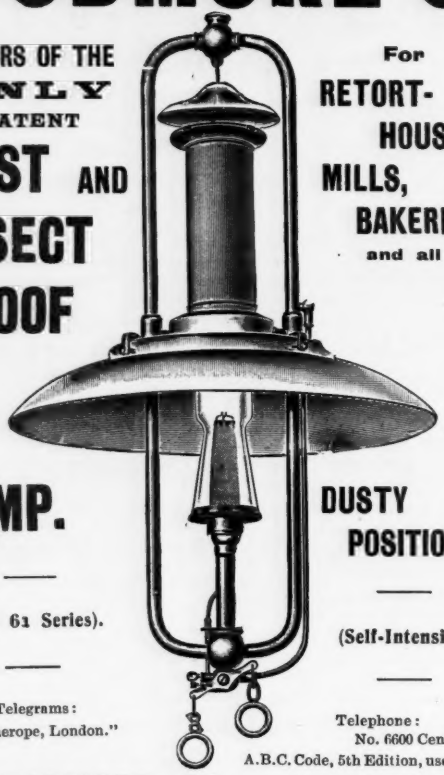
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HIGH PRESSURE SERVICE GOVERNORS.

High Pressure Diaphragm Governor.
Large Gas Ways, Balanced Valves, also High-Pressure Governors with Mercurial Seal.
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For the **LIGHTING SEASON,** 1910-1911.
INVERTED GASFITTINGS.

LATEST DESIGNS.
NOTE.—If you have not already received our **L**atest **S**eason's **D**esigns of Inverted Gas Pendants and Brackets—kindly write for same without delay to
JAMES MILNE & SON, LTD.,
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GRAETZIN LIGHT.

MOST IMPORTANT!

Latest Development:

600 C.P. LOW PRESSURE LAMP.

1000 C.P. LOW PRESSURE LAMP.

GAS REGULATION on the TOP of the LAMP.

All Goods are unapproachable for economy and durability.

Ask Wholesalers for Catalogue and Prices.

THE GLENBOIG UNION FIRE-CLAY CO., LTD.

GLENBOIG FIRE-BRICKS AND GAS-RETORTS.

Every Genuine Glenboig Brick, Block, Gas-Retort, &c., is legibly stamped with one or other of the Glenboig Company's Registered Trade Marks, as here shown.

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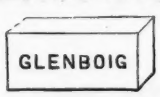

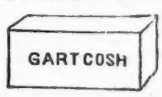

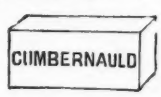

The Glenboig Trade Marks are imitated, and the Glenboig Name unfairly used by Makers of a lower Class of Goods, which, when sold under their own name, command much lower prices.
The Genuine Brand, Stamped on the Goods, is the only Reliable Guarantee to the Purchaser.

GAS-RETORTS, FIRE-BRICKS, BLOCKS, &c., &c.

The SPECIAL BRICKS used in the Construction of Gas Furnaces for Heating Retorts.

GLENBOIG BRICKS

Works: GLENBOIG, LANARKSHIRE.
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56 Prize Medals and Diplomas of Honour.
Highest Award wherever exhibited.

The GLENBOIG BRICKS, BLOCKS, AND RETORTS combine, in the highest degree, the qualities of not melting, and not splitting, when subjected to the highest heats and most sudden changes of temperature, and are, in consequence, found to be economical, even in districts where the local bricks can be had at half the price.

Undernoted we give a Table of Analysis and Physical Characteristics of a sample of Glenboig Fire-Clay by J. T. Norman, London; and, in submitting a report from a responsible and reliable public analyst, we would here draw attention to the unreliable character of some recently published analyses where a manufacturer selects not only his own samples, but also those of his competitor, and has them treated by a private analyst. SUCH STATEMENTS ARE ALTOGETHER UNTRUSTWORTHY.

ANALYSIS OF GLENBOIG FIRE-CLAY.

By JOHN T. NORMAN, Esq., F.C.S., &c., The City Central Laboratory, LONDON.

THE GLENBOIG UNION FIRE-CLAY CO., LTD., GLENBOIG, SCOTLAND.

23, Leadenhall Street,
London, E.C., September 21st, 1909.

Dear Sirs,

I have completed the investigation of the samples of Clay received from you on the 10th inst., and now beg to report the results.

CHEMICAL ANALYSIS.

	Raw.	Fired.
Silica, free	3·03	3·49
Silica, combined	43·20	49·77
Alumina	36·55	42·10
Ferric oxide	1·80	2·08
Titanic oxide	1·30	1·50
Lime	trace	trace
Magnesia	trace	trace
Alkaline oxides	trace	trace
Sulphates as trioxides	0·92	1·06
Loss on Ignition	13·20	—
	100·00	100·00

PHYSICAL RESULTS.

Density	2·65
Volume weight	1·90
Porosity	15·4 %
Linear shrinkage at 100° C.	3·70%
" " " 1050° C.	4·76%
" " Total	8·46%
Volume shrinkage at 100° C.	10·7 %
" " " 1050° C.	12·6 %
" " Total	23·3 %
Plasticity	20·0 %
Fire Stability	1850° C. equiv. 3362° F.

(SEGER CONE 36.) (New Scale CONE 38.)

(Signed) J. T. NORMAN.

This Clay is remarkable for its high percentage of Alumina and for the almost complete absence of ingredients tending to lower the refractory properties; its fire stability is extremely high. For some years past I have been urging clients who are working the Clays of the Coal Measures to search for such a material, but you are the first to discover a supply. The possession of this Clay places you in a unique position amongst the manufacturers of refractory goods throughout the world, and I have no doubt will, if duly exploited, enable you to drive out of the market the large quantities of foreign fire-bricks which are being poured into this country for use in the construction of bye-product ovens and for other purposes.—I am, yours faithfully,

JOHN T. NORMAN.

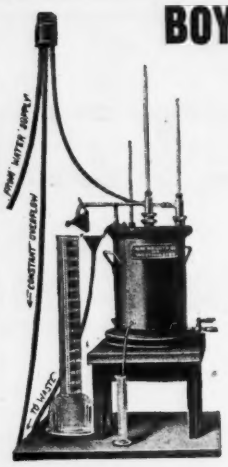
LEAD WOOL

Is sent out in Skeins all ready for use.
Every Skein of equal weight and length.
The Lead Wool Joint is built up evenly all the way through.
Lead Wool requires no melting and can be used in water without risk.

Lead Wool Joints are Twice as Strong as Cast Lead Joints and cost 33⅓ per cent. less.

THE LEAD WOOL CO., LTD., SNODLAND, KENT.

Telegrams: "STRENGTH, SNODLAND." Telephone 199 SNODLAND.



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AS USED IN THE

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Certified if Desired.

LOWER PRICE THAN ANY OTHER MAKER.

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ALEXANDER WRIGHT & CO. LTD.

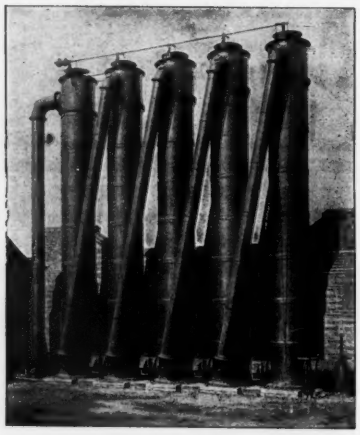
WESTMINSTER.

THE WIGAN COAL & IRON CO., LIMTD.,

Are the exclusive Owners of the well-known HAIGH HALL & KIRKLESS HALL GAS COAL COLLIERIES, Wigan, and of the Manton Steam and House Coal Collieries, Worksop, Notts, and supply the well-known Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, Cannel Nuts, House and Steam Coals, &c.

MIDLAND AND WEST OF ENGLAND DISTRICT OFFICE: *6, CORPORATION STREET, BIRMINGHAM—Sole Agent: A. C. SCRIVENER.*
Telegraphic Address: "WIGAN, BIRMINGHAM." Telephone: No. 200.

LONDON DISTRICT OFFICE: *6, STRAND, LONDON—C. PARKER & SON, Sole Agents.* Telegraphic Address: "PARKER, LONDON."



GASHOLDERS.

WITH GUIDE FRAMING OR COLUMNLESS.

LUTED PURIFIERS LUTELESS

WATER Condensers AIR

GAS PLANT OF EVERY DESCRIPTION DESIGNED AND ERECTED.

C. & W. WALKER, LTD., MIDLAND IRON WORKS, DONNINGTON, SALOP. 110, CANNON STREET, LONDON, E.C.

THE CENTENARY PETROL GAS TURBINE GENERATOR.

NOTE—**It does not matter how irregularly the number of Lights in use vary, this is the only Petrol-Air Gas Generator which maintains under all conditions of tests an unvarying quality of Gas.**

TESTIMONIAL.

ROYAL SCOTTISH NURSING INSTITUTION,
69, QUEEN STREET, EDINBURGH, 24*th February*, 1909.

DEAR SIRS,

I have much pleasure in testifying to the brilliance of the Lights, purity of the atmosphere of the rooms, agreeableness to the eyes, with entire absence of odour, together with the fullness of health, enjoyed by myself and inmates of St. Cyr. Ceres, during my residence for four months during Winter, while the house was lit night and morning (and small lights during night) by Petrol-Air Gas produced at the Village Gas-Works by a Centenary Turbine Gas Generator. The brilliance and comfort with the lights could not be excelled.

I am, yours truly,

(Signed) Nurse B. BROWNIE.

N.B.—St. Cyr House has 50 Burners for Lighting, besides points for Cooking and Ironing.

THE CENTENARY GAS COMPANY (Dept. M.)

109, HOPE STREET, GLASGOW. 11, QUEEN VICTORIA STREET, LONDON.

NON-EXPLOSIVE and ECONOMICAL.

Welsbach
LIGHT
Inverted Arc Lamp, Fig. 623.

Storm Proof—
For Exterior Lighting.

Welsbach-Kern
(Patent) Inverted System

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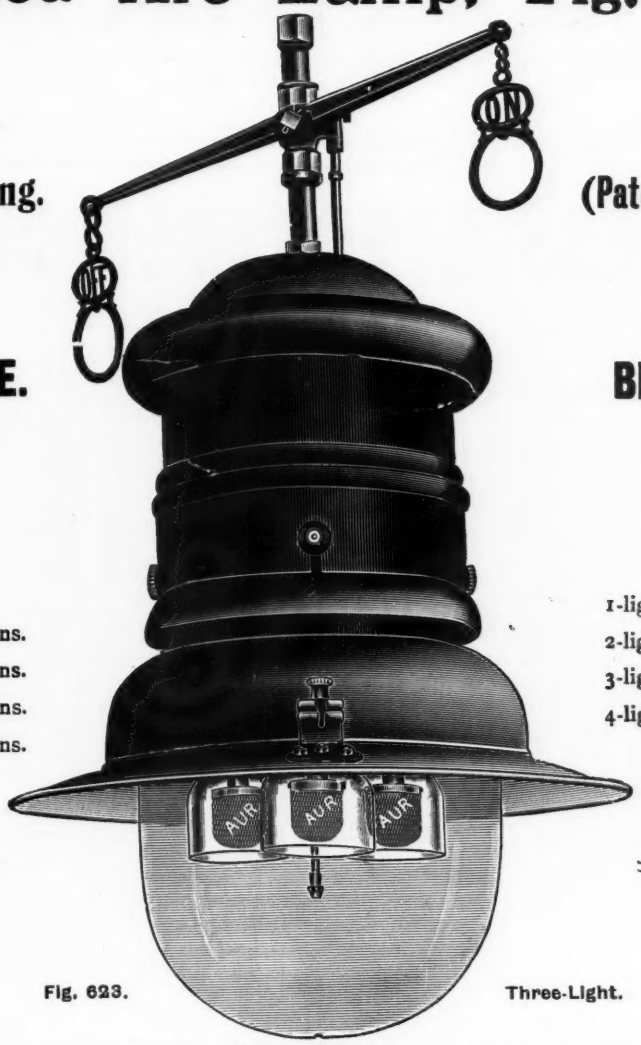

Fig. 623. Three-Light.

Height over all.

1-light . . .	1 ft. 8 ins.
2-light . . .	2 ft. 4 ins.
3-light . . .	2 ft. 4 ins.
4-light . . .	2 ft. 7 ins.

Width over all.

1-light . . .	1 ft. 1 in.
2-light . . .	1 ft. 5 ins.
3-light . . .	1 ft. 5 ins.
4-light . . .	1 ft. 8 ins.

ENAMELLED Green Steel Casing, fitted with Welsbach-Kern Inverted Burners, Gas and Air Regulators operated from outside. Sliding Door to give access to Burners for cleaning purposes. Fitted with Magnesia Nozzles, Welsbach Mantles, and Glass Mantle Protectors. Complete as shown. Highly efficient and regenerative.

	Gas per hour.	*C.P.*	*Steel.*	*Copper Case.*
1-light	4 feet	125	**30/-**	**5/-** extra.
2-light	8 feet	260	**47/6**	**6/-** extra.
3-light	12 feet	400	**52/6**	**6/-** extra.
4-light	16 feet	550	**72/6**	**9/-** extra.

All on or off, or One light on and the rest off, **7/6** per Lamp extra. Cup and Ball, **3/6** per Lamp extra.

RENEWALS.

Glass Mantle Protectors (Fig. 623) **3/4½** per dozen, or in case lots of 5 gross, **33/-** per gross.

	1-Light.	*2-Light.*	*3-Light.*	*4-Light.*
Clear Glass Globes, each	**2/3**	**5/9**	**5/9**	**9/-**
" " " In Case lots per dozen.	**19/6**	**57/9**	**57/9**	**93/-**
Case contains . .	*80*	*18*	*18*	*12*

		1-Light.	*2-Light.*	*3-Light.*	*4-Light.*
Wired Globes, extra	each	**2/-**	**2/-**	**2/9**	**3/6**
Parabolic Reflector, extra	"	**3/6**	**6/-**	**7/6**	Not made

Welsbach Mantles, **4½d.** each, or **4s. 3d.** per dozen, subject as usual.

The Welsbach Mantles for Upright lighting are "C," "CX," and "Plaissetty," price **4½d.** each.

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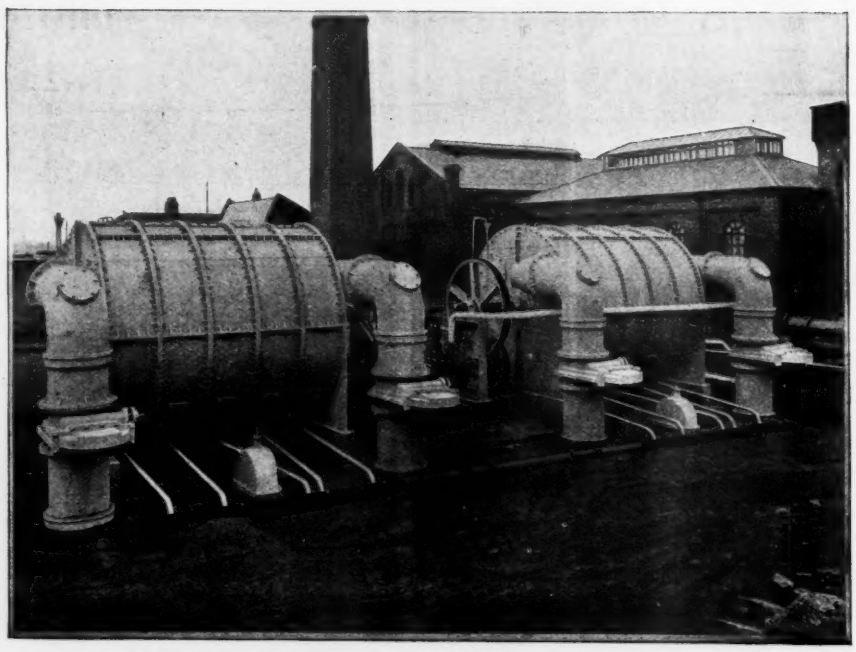

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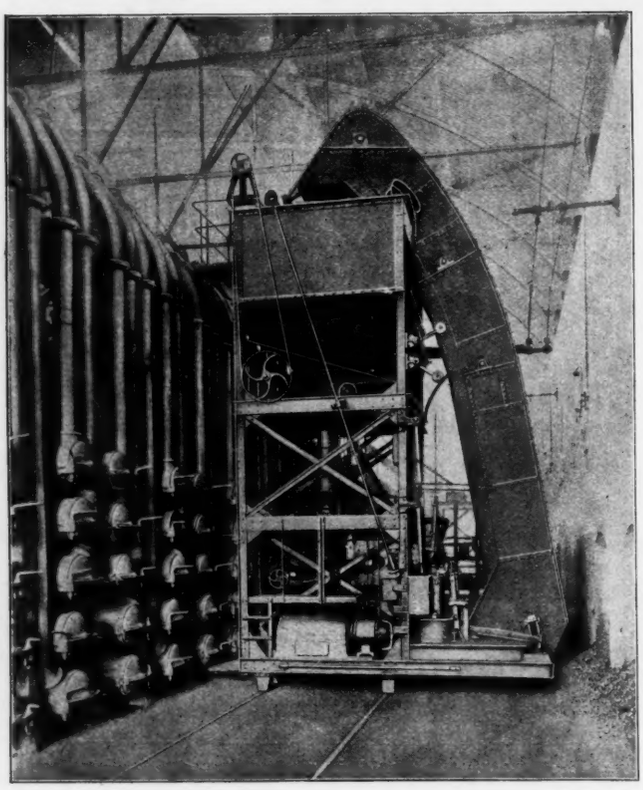

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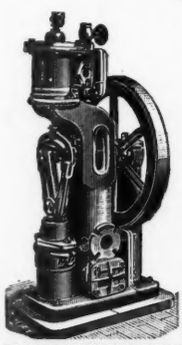

Fig. 705. "SINGLE RAM" STEAM-PUMP.

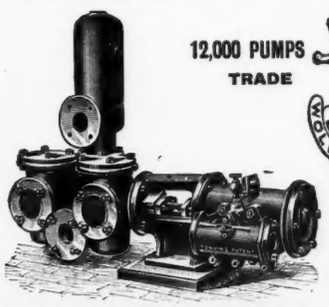

Fig. 598. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

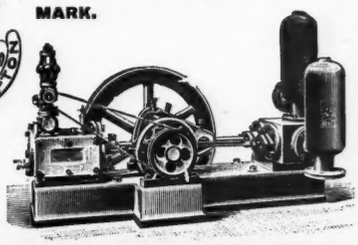

Fig. 685. "RELIABLE" STEAM PUMP FOR TAR AND THICK FLUIDS.

Fig. 712. "DOUBLE-RAM" STEAM-PUMP.

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